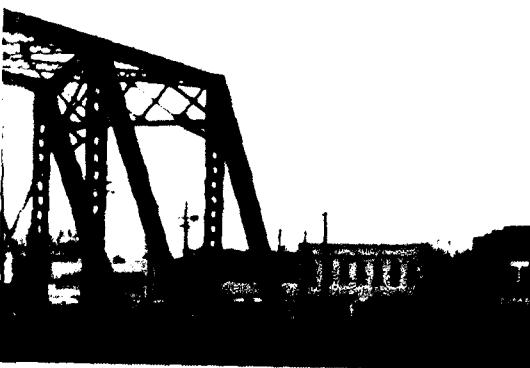


US Army Corps
of Engineers



AD-A271 857



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Waterways E

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TECHNICAL REPORT GL-92-1

LOGIC RECONNAISSANCE
OF
SHREVEPORT, LOUISIANA TO
GERFIELD, TEXAS REACH
REDRIVER WATERWAY

by

PAUL ALBERTSON

Geotechnical Laboratory

DEPARTMENT OF THE ARMY
Waterways Experiment Station, Corps of Engineers
3909 Halls Ferry Road



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S A D

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Waterway

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Apr

REDRIVER WATERWAY

by

PAUL ALBERTSON



Geotechnical Laboratory

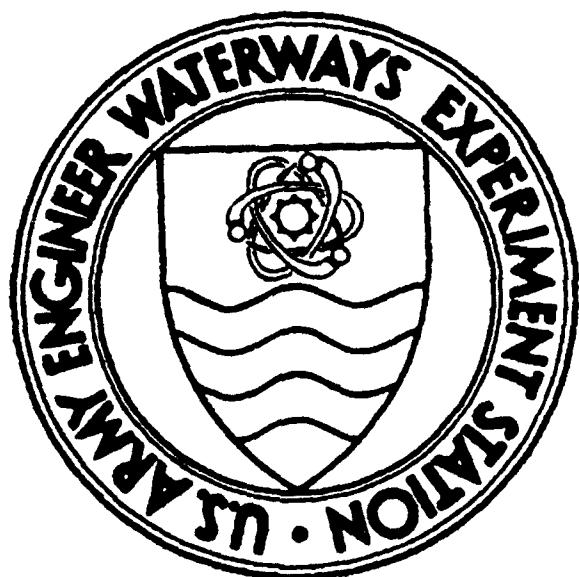
DEPARTMENT OF THE ARMY

Waterways Experiment Station, Corps of Engineers

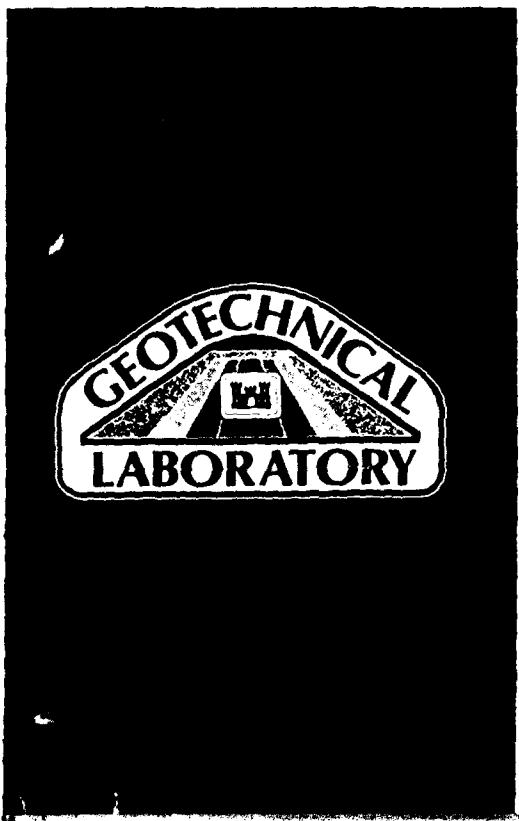
3909 Halls Ferry Road

Vicksburg, Mississippi 39180-6199

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reproduct-
book and



February 1992



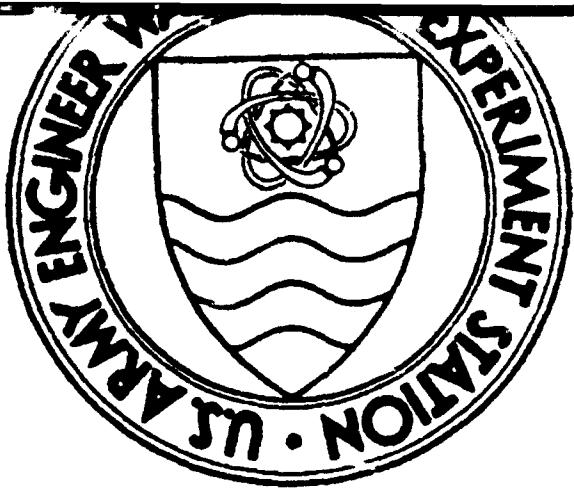
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93-26717



U.S. Army
Vicksburg



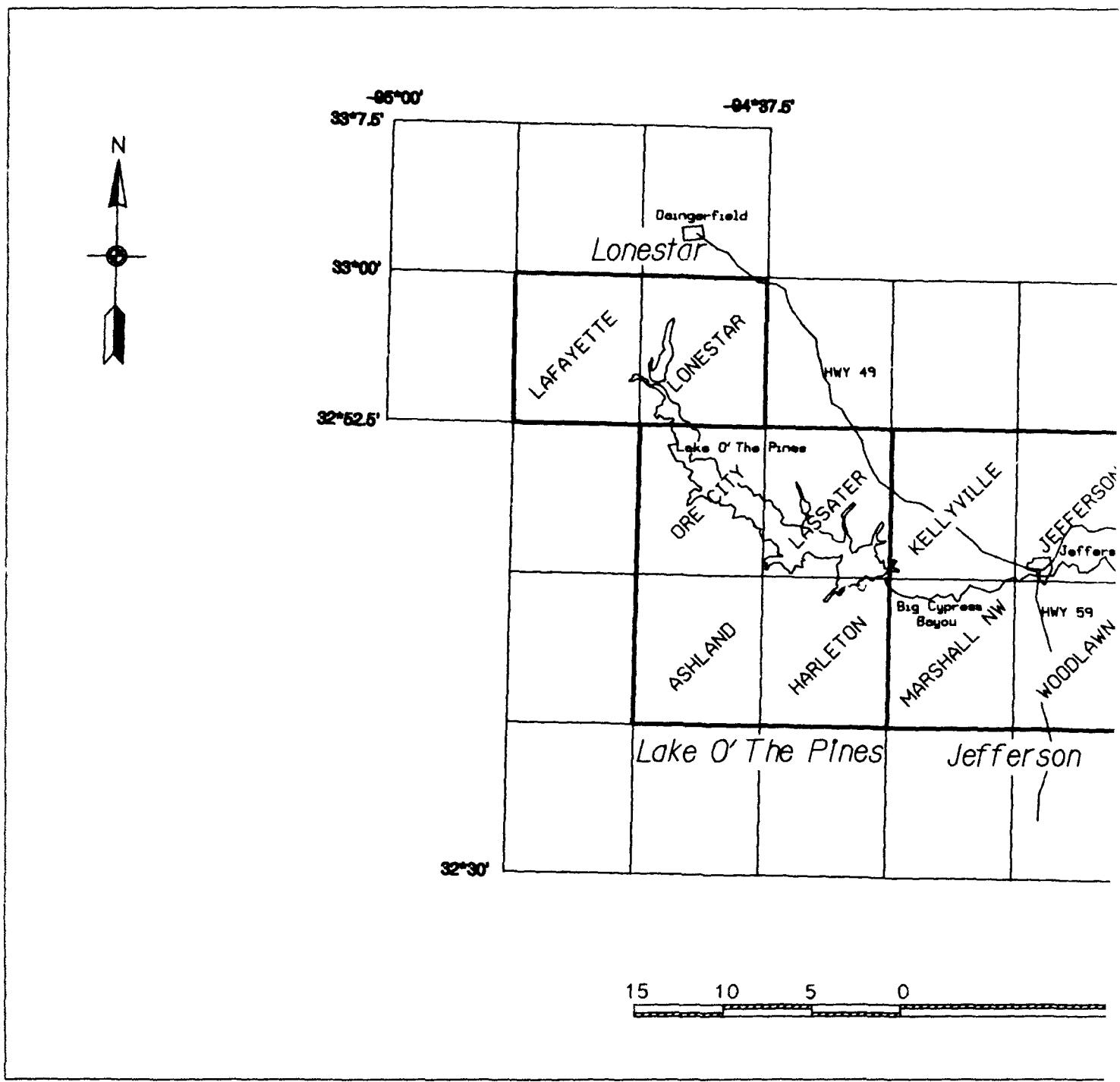
February 1992

Approved For Public Release; Distribution Is Unlimited

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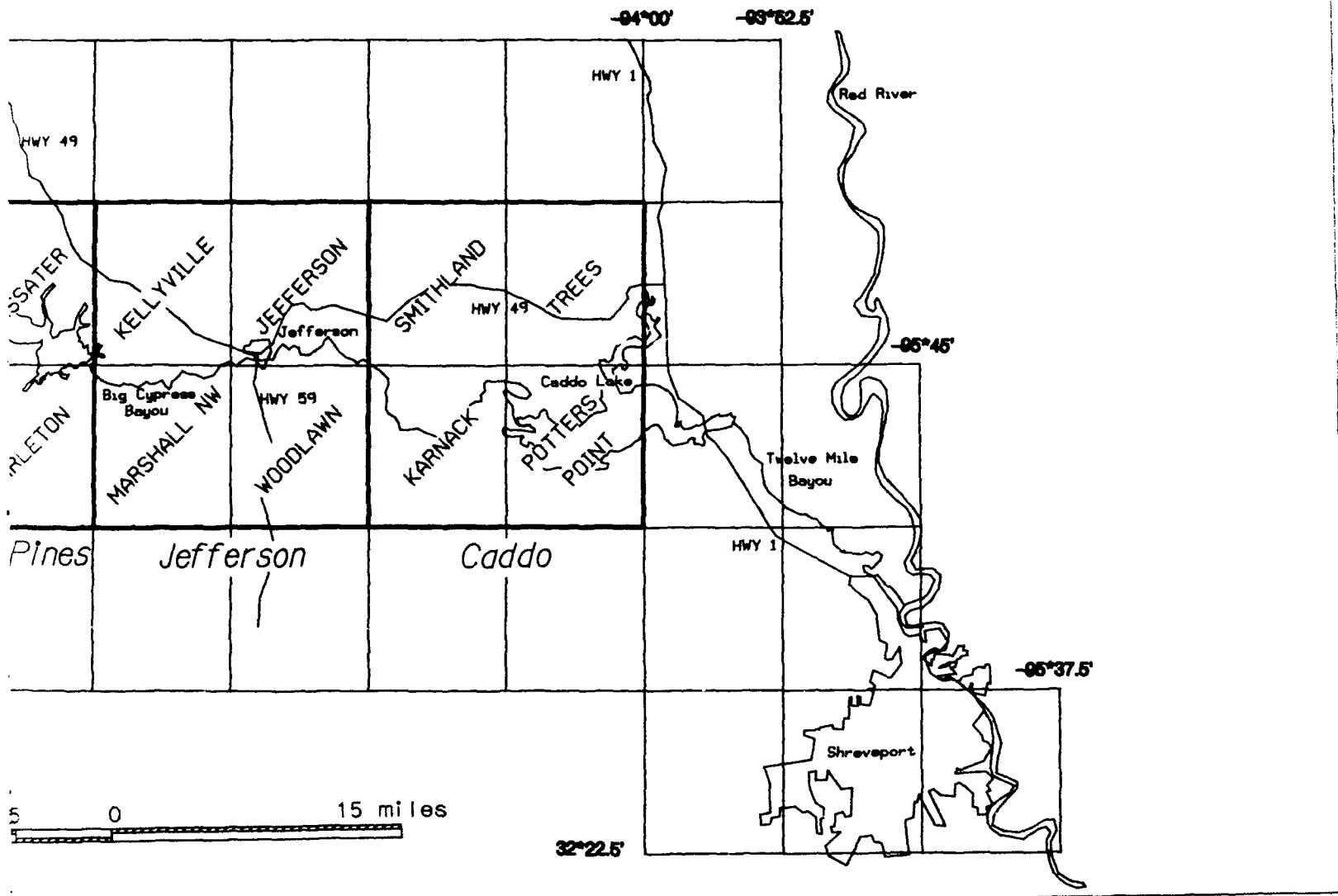
U.S. Army Engineer District, Vicksburg
Vicksburg, Mississippi 39180-0060

93 11 3 048



Index Of Geologic

ERA	SYSTEM	SERIES	GROUP	FORMATION OR UNIT	GENERALIZED SECTION	
	QUATERNARY	RECENT	ALLUVIUM	TOPSTRATUM		Differentiated laid down by r and brown cl.
	EISTO-CENE			SUBSTRATUM		Massive sands coarser-grained in the middle of
		TERRACE DEPOSITS	UNDIFFERENTIATED			Clays and s.



Index Of Geologic Maps

GENERALIZED SECTION	LITHOLOGY	HYDROGEOLOGY
	Differentiated into six distinct environments of deposition laid down by meandering streams. Deposits composed of gray and brown clays and silts.	Yields little water, not generally an aquifer.
	Massive sands and gravels. Fine to medium sands becoming coarse-grained with depth. First gravels generally appear near the middle of the deposit.	Yields small quantities of fresh water to a few wells.
	Clays and silts grading downward into sands and gravels.	Yields small quantities of fresh water to a few wells.

QUATERNARY		ALLUVIUM	TOPSTRATUM	DOTTED = bedded lined down by med and broken strata	
PLEISTO-CENE	RECENT		SUBSTRATUM		
		TERRACE DEPOSITS	UNDIFFERENTIATED		Massive sands or coarse-grained in the middle of the
					Clays and silts
			SPARTA		Nonmarine, massive shale. In subsur. common.
		CLAIBORNE	WECHES	S	Green to red, g. ironstone concre.
	EOCENE		QUEEN CITY	S	Interbedded, high sands and clays
			REKLAW	S	Soft to hard, light fossiliferous. I. crystals.
			CARRIZO (NOT PRESENT IN STUDY AREA)		Fine- to very f. bedded sands w. Locally iron-rich formation.
CENOZOIC					
TERTIARY					
	?	WILCOX	UNDIFFERENTIATED		Interbedded, gray medium-grained
	PALEOCENE				
		MIDWAY			Massive, dark gray with calcareous
				S	Light to dark gray with occasion.
				S	

Generalized Stratigraph

Differentiated into six distinct environments of depositional laid down by meandering streams. Deposits composed of gray and brown clays and silts.	Yields little water, not generally an aquifer.
Massive sands and gravels. Fine to medium sands becoming coarser-grained with depth. First gravels generally appear near the middle of the deposit.	Yields small quantities of fresh water to a few wells.
Clays and silts grading downward into sands and gravels.	Yields small quantities of fresh water to a few wells.
Nonmarine, massive sands with minor amounts of sandy clay or shale. In subsurface, lignite and other organic materials are common.	Yields small quantities of fresh water to shallow wells locally.
Green to red, glauconitic, fossiliferous, sands and clays with ironstone concretions.	Yields small quantities of fresh water to wells locally.
Interbedded, light gray, glauconitic, lignitic, fossiliferous, sands and clays.	Yields small to moderate quantities of fresh water to wells.
Soft to hard, light gray green to red, glauconitic, fossiliferous, lignitic micaceous sands and clays with gypsum crystals.	Yields small quantities of fresh water to wells.
Fine- to very fine-grained, feldspathic, glauconitic, cross- bedded sands with some siltboulders and rounded inclusions. Locally iron-cemented sandstone boulders are found at top of formation.	Yields small to moderate quantities of fresh water to wells.
Interbedded, gray to chocolate brown, calcareous, fine- to medium-grained sands, lignitic silts, clays, and lignite.	Yields moderate to possibly large quantities of fresh water to wells.
Massive, dark gray to black, lignitic, micaceous, calcareous clay with calcareous concretions.	Yields no water.
Light to dark gray, fossiliferous, glauconitic, silts and clays with occasional chalk lenses and calcareous concretions.	

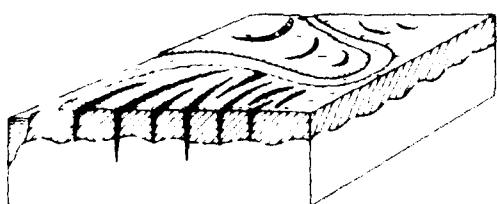
Generalized Stratigraphic Column

TOPS.RATUM
DEPOSITIONAL
ENVIRONMENT

DIAGRAMMATIC ILLUSTRATION

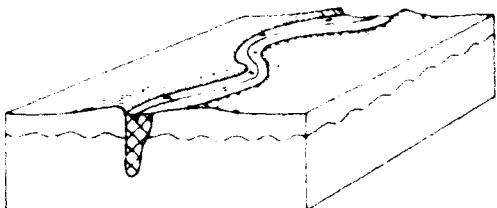
TYPICAL APPEARANCE
ON AERIAL PHOTOGRAPHS

POINT BAR



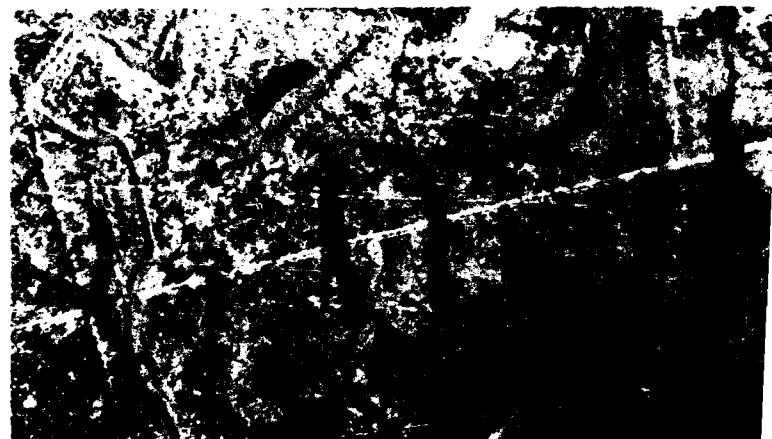
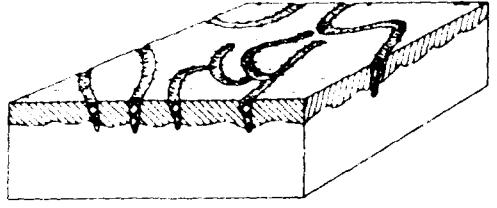
2000 1000 0 2000 Ft.
Scale

ABANDONED
COURSE



2000 1000 0 2000 Ft.
Scale

ABANDONED
CHANNEL

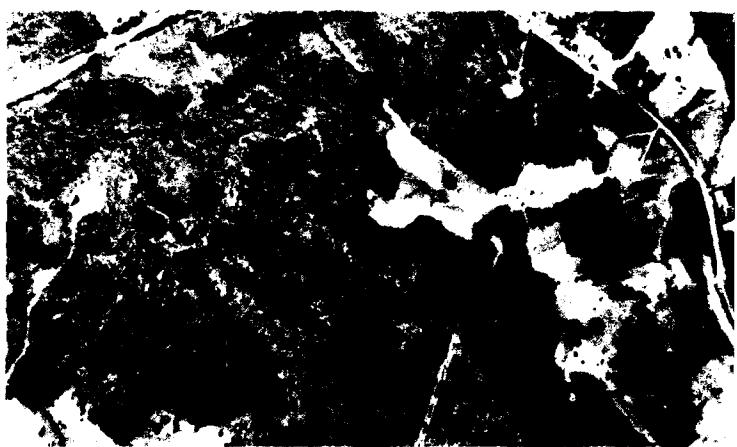
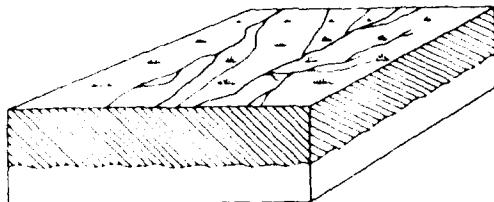


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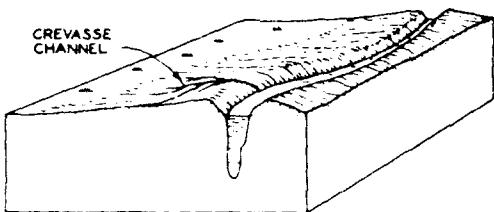
2000 1000 0 2000 Ft.
Scale

BACKSWAMP



2000 1000 0 2000 Ft.
Scale

NATURAL
LEVEE



2000 1000 0 2000 Ft.
Scale

Description of Depositi

DTIC QUALITY ASSURANCE

2000 Ft.



2000 Ft.

Backswamp deposits consist of fine grained sediments laid down in broad, shallow basins within the floodplain during major periods of stream flooding. The sediment carrying floodwater may be ponded between the natural levee ridges and the uplands. Backswamp areas typically have very low relief and a distinctive, and complicated drainage pattern. The channels alternately serve as tributaries and distributaries at different times of the annual flood cycle.

Backswamp deposits are scarce in the project area. The backswamps occur between valley walls and meander belts. Based on limited data the thickness of these deposits are 20 to 30 feet in the Big Cypress Bayou Valley.

Typical backswamp deposits are brown to gray clays with scattered lenses of silt, organic matter and wood fragments.



2000 Ft.

Natural levees are broad, low ridges which flank both sides of streams that periodically overflow their banks. The coarsest and greatest quantities of sediment are deposited closest to the streams channels. The natural levees are highest and thickest in these areas and gradually thin away from the channels. In general, the greater the distance from the stream, the greater the percentage of the finer grained sediments. Small drainage channels trending at right angles to the parent stream down the backslope of the levees are common. Major crevasses are indicated when these channels are large and pronounced. Abandoned crevasse channels are often filled with sediments that are distinctly coarser than the remainder of the natural levee.

Natural levees occur along abandoned courses and channels and adjacent to the active Cypress bayou channels. The higher and better drained levee deposits bordering older courses are visible by noting a vegetation change from cypress (*Taxodium*) to oaks and pine (*Quercus* and *Pinus*). Other levee deposits are obscured by recent postsettlement basin infilling or simply erased by reworking by younger courses. Natural levees paralleling courses vary in height from 2 to 5 feet and in width from 100 to 1500 feet.

Natural levee deposits typically consist of brown silty sands, silt, and silty clays which exhibit moderate amounts of oxidation. Since natural levees are well drained, the water content of these soils is low and organic matter is seldom present except for roots.

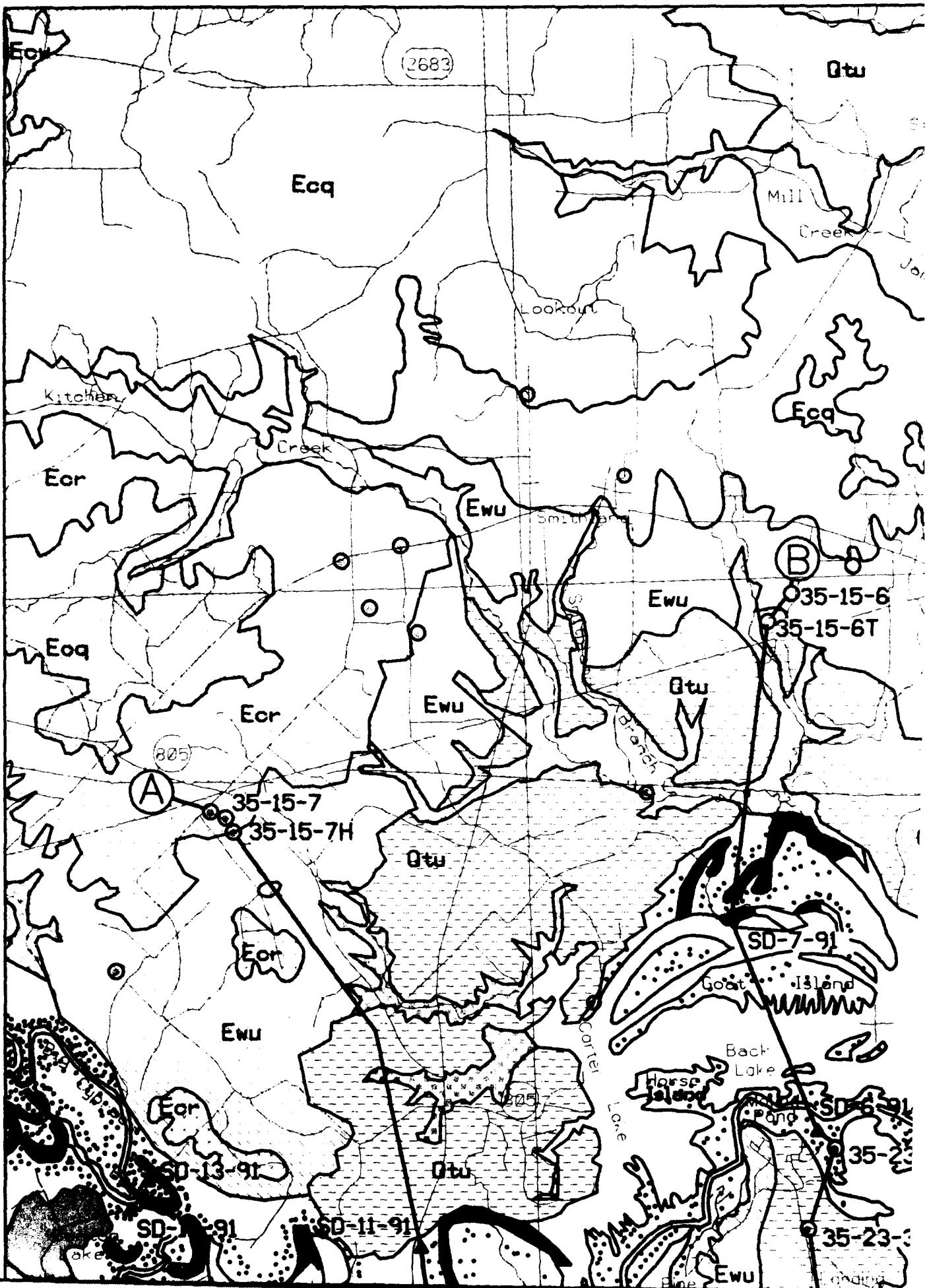
I E of Depositional Environments

EXCERPTED 8

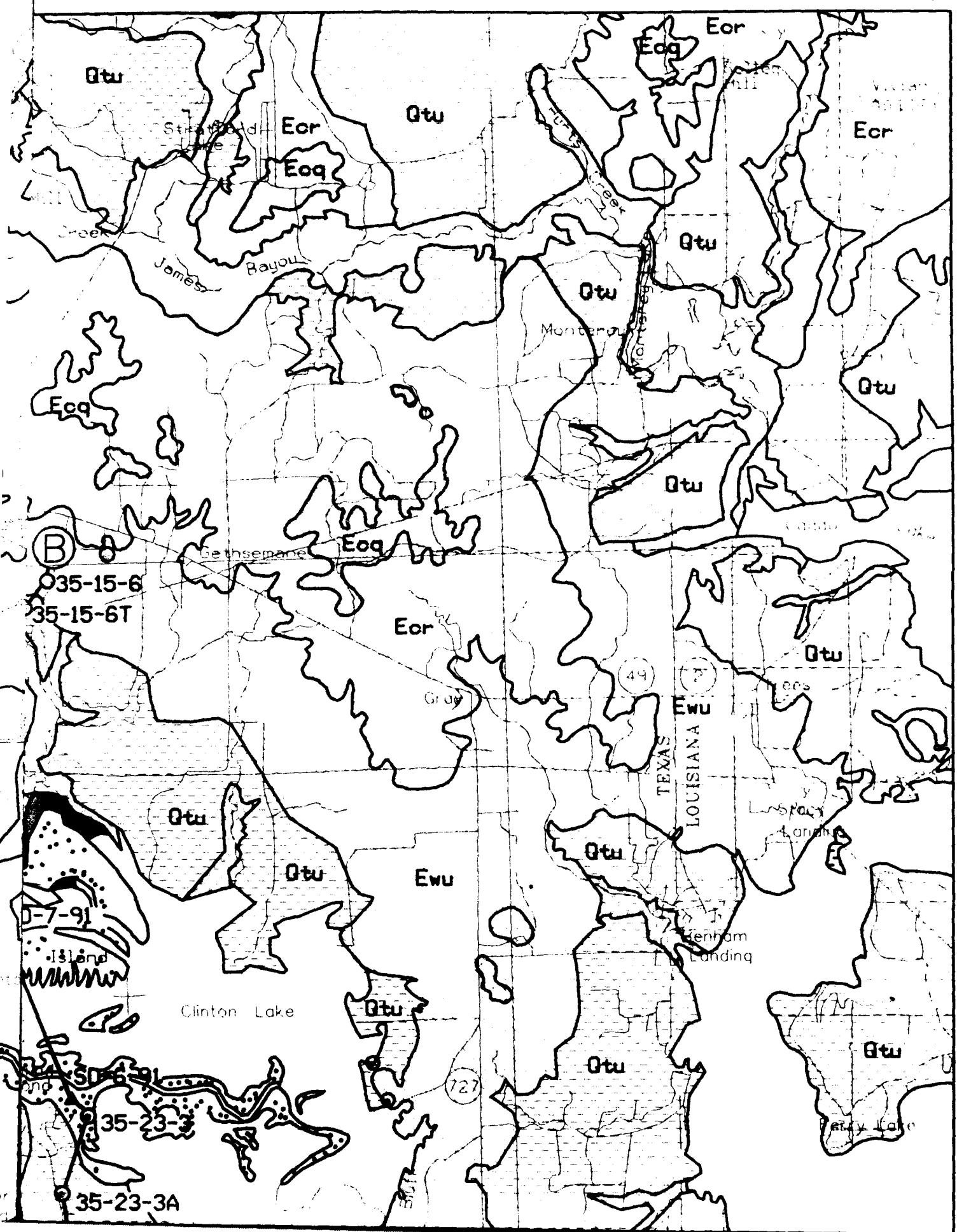
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NTIS CRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By _____	
Distribution:	
Availability Codes	
Dist	Avail. Major Special
A-1	

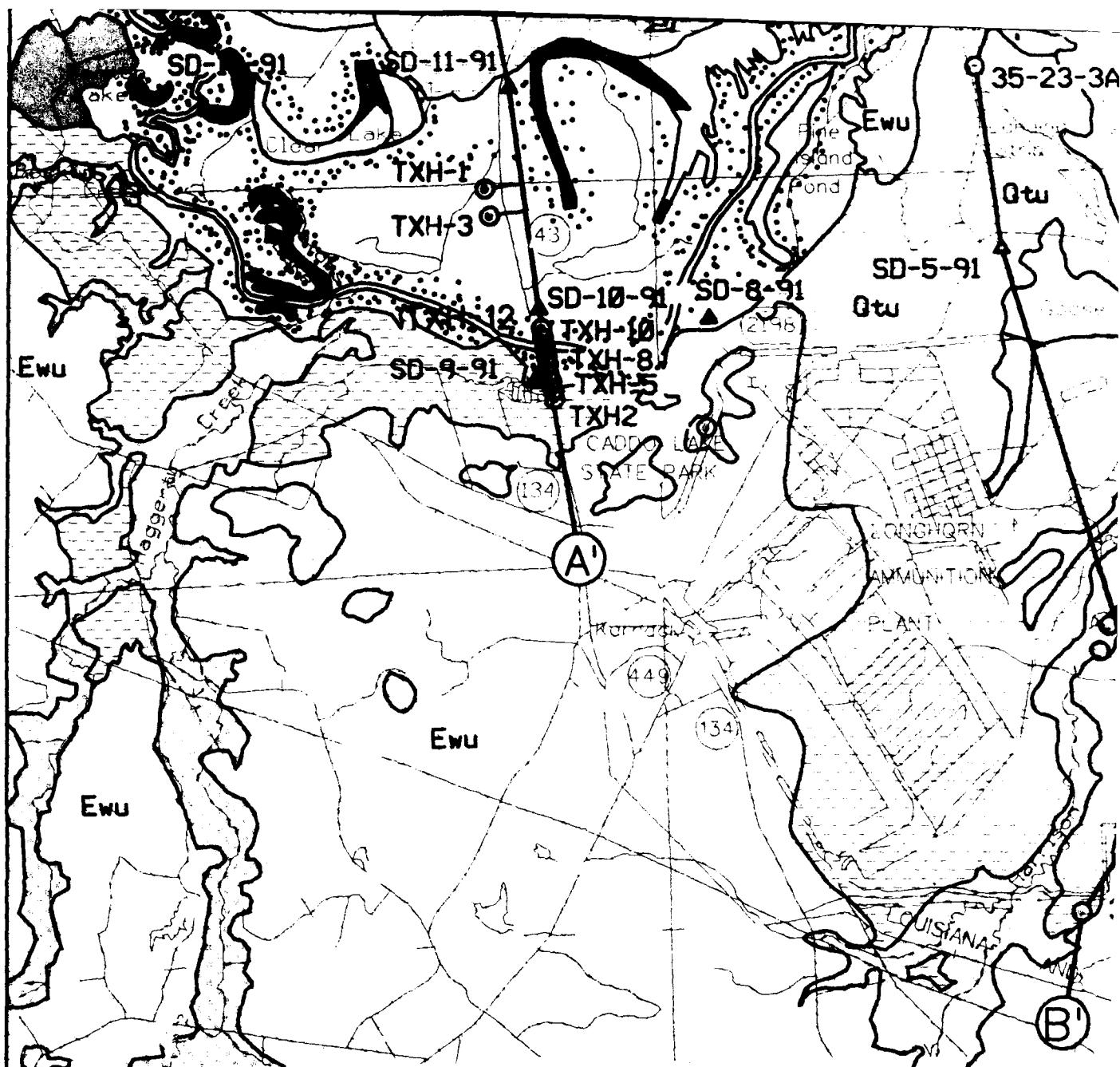
94° 15'

32° 52' 30"



94° 00
32° 52' 30"





LEGEND

QUARTERNARY

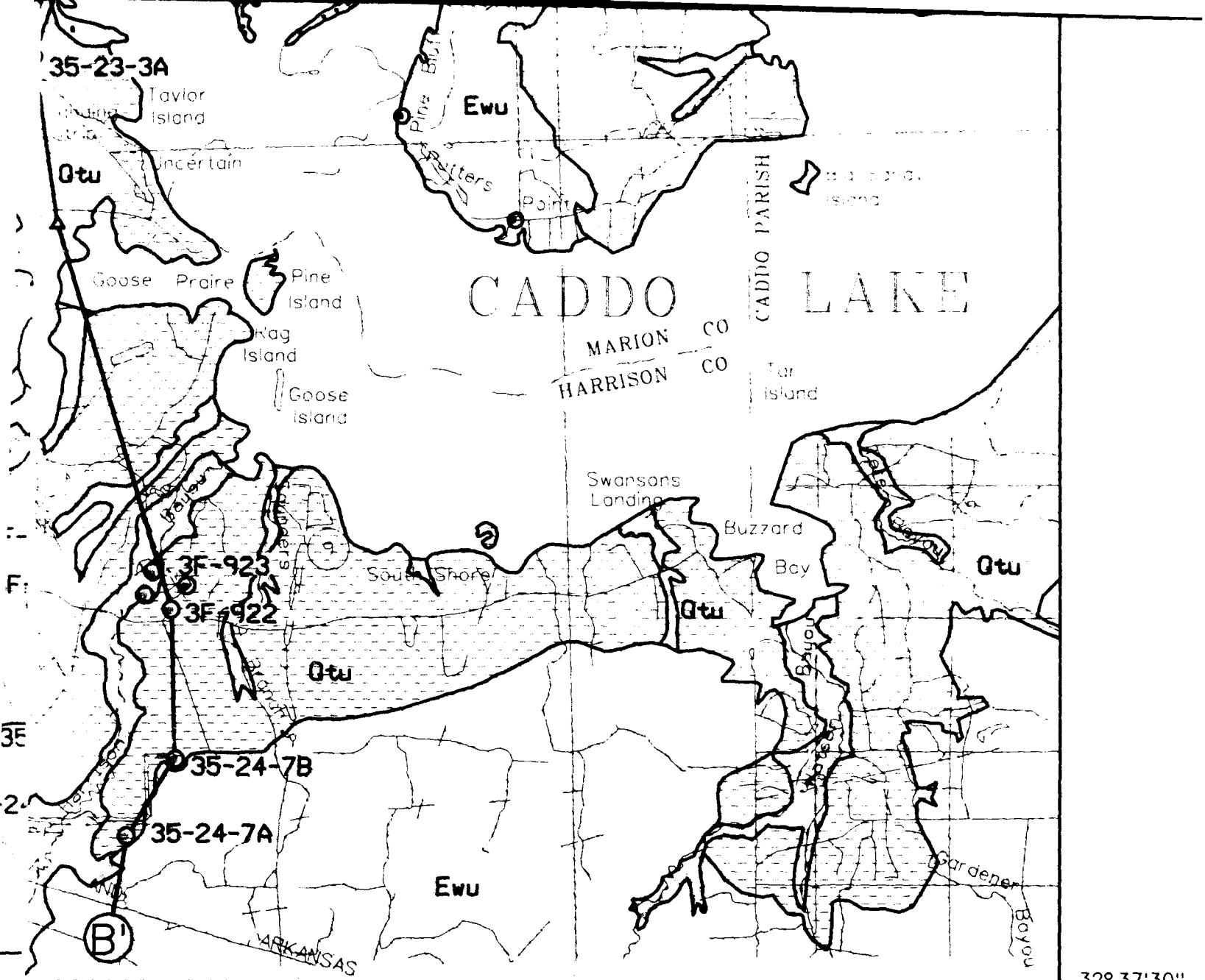
-  NATURAL LEVEE
-  POINT BAR
-  BACKSWAMP
-  ABANDONED CHANNEL
-  ABANDONED COURSE
-  UNDIFFERENTIATED ALLUVIUM

TERTIARY

EOCENE
CLAIBORNE GROUP
Ecs SPARTA FORMATION
Eew WECHES FORMATION
Ecr QUEEN CITY FORMATION
Ecr REKLAW FORMATION
Ew WILCOX GROUP UNDIFFERENTIATED

PLEISTOCENE

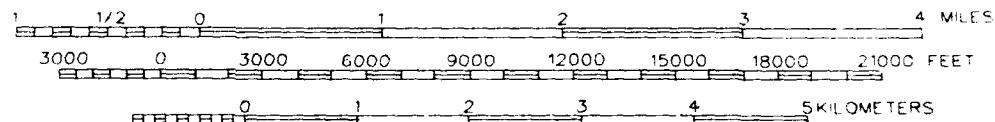
QW - UNDIFFERENTIATED TERRACE DEPOSITS



32° 37'30"

94° 00

SCALE : 1:625000

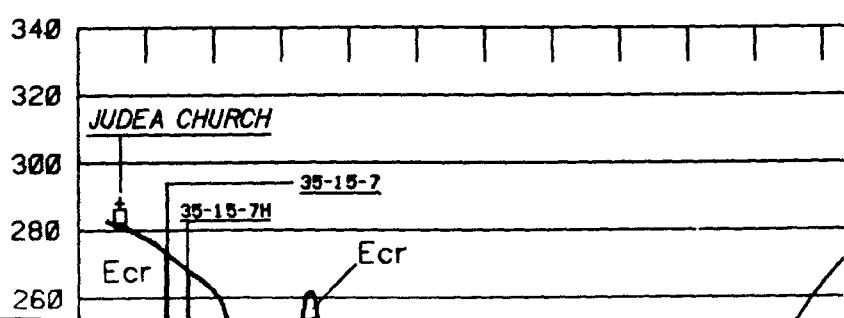
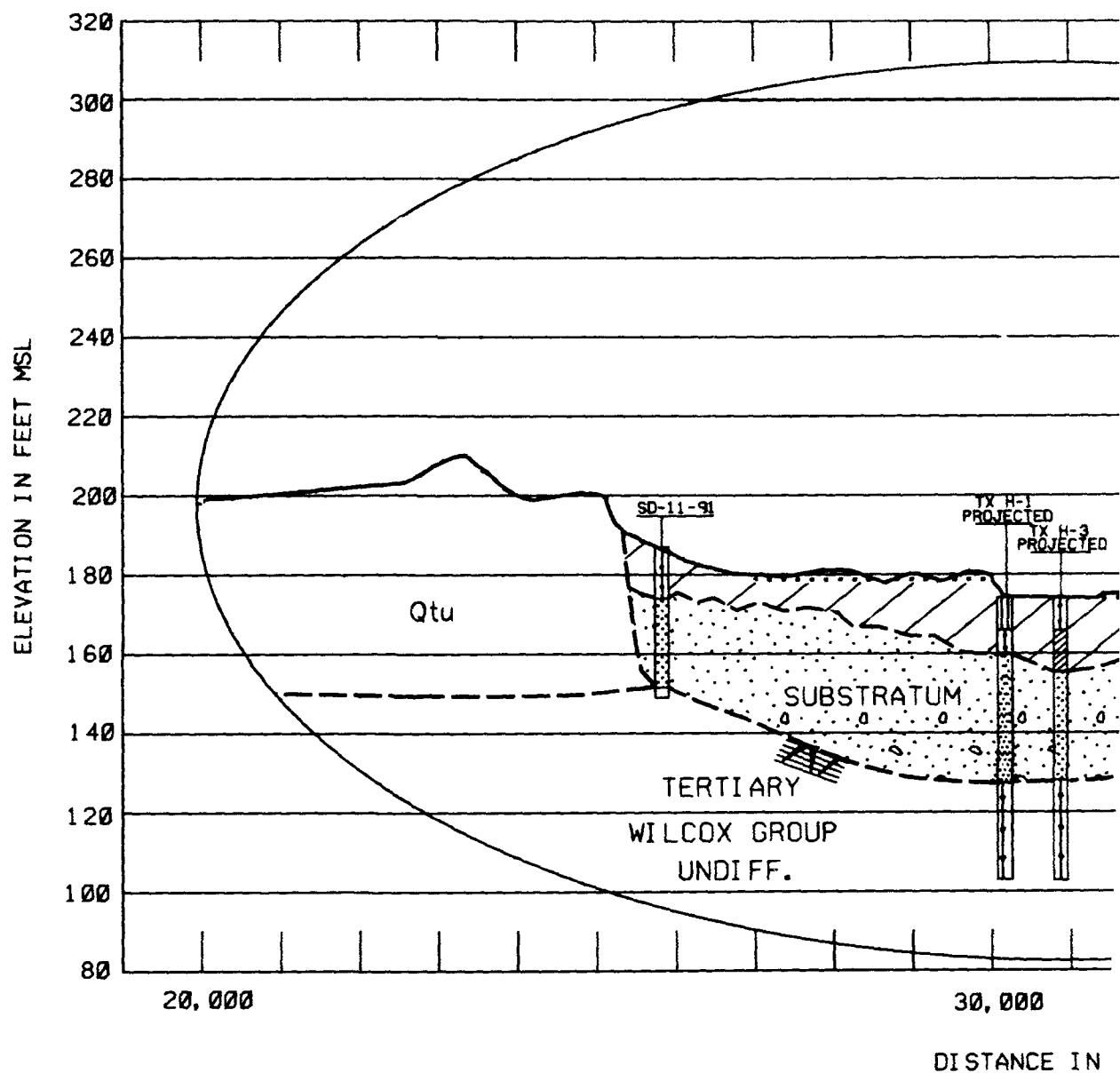


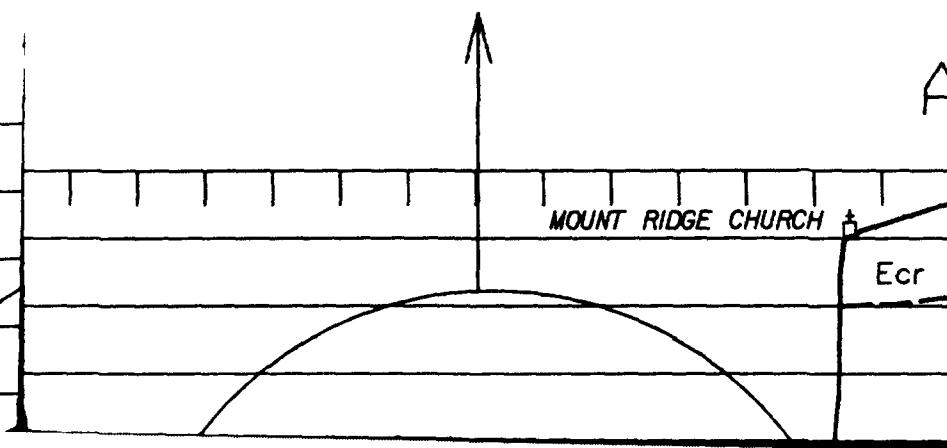
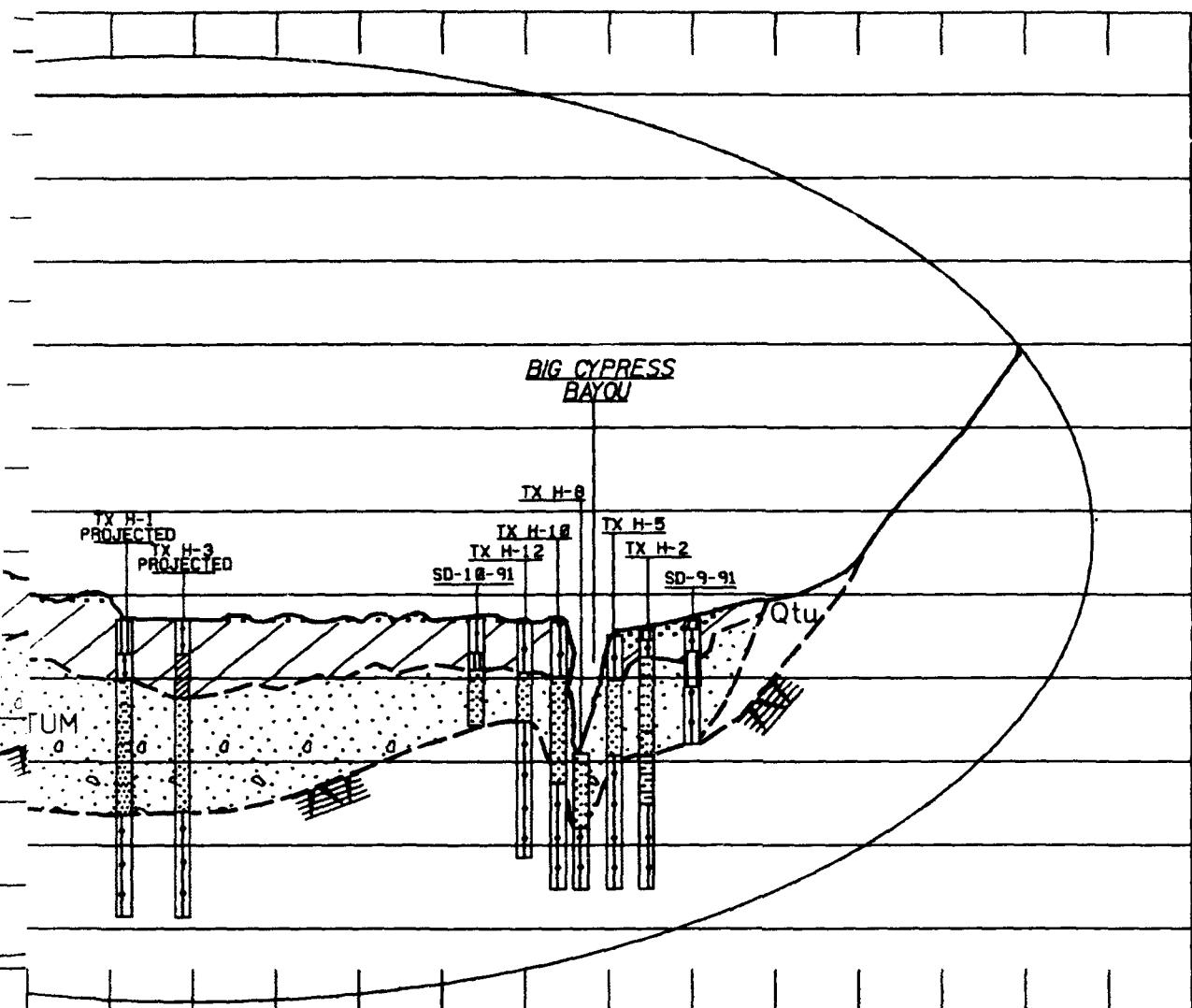
SHREVEPORT, LA - DANGERFIELD, TX

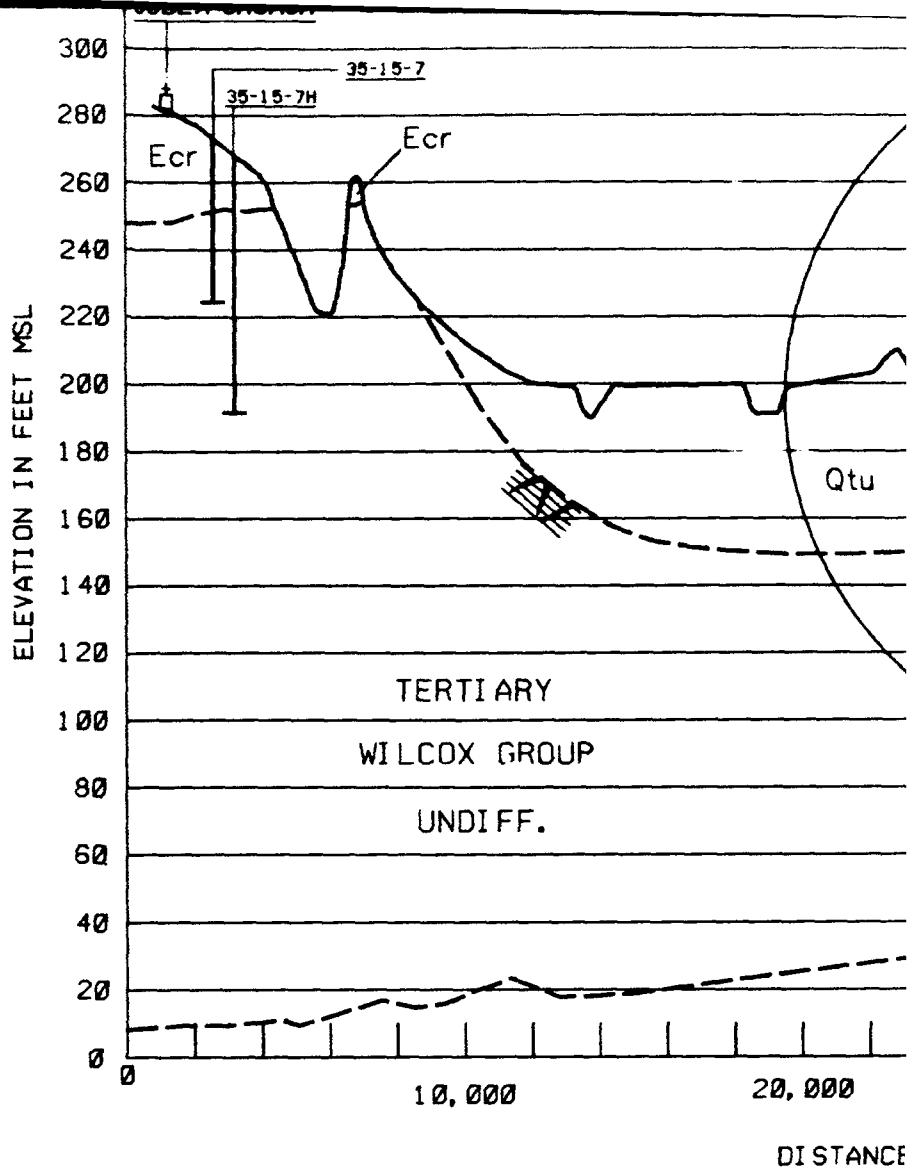
SURFACE GEOLOGY

CADDO, TX

2/92







LEGEND

ENVIRONMENTS OF DEPOSITION

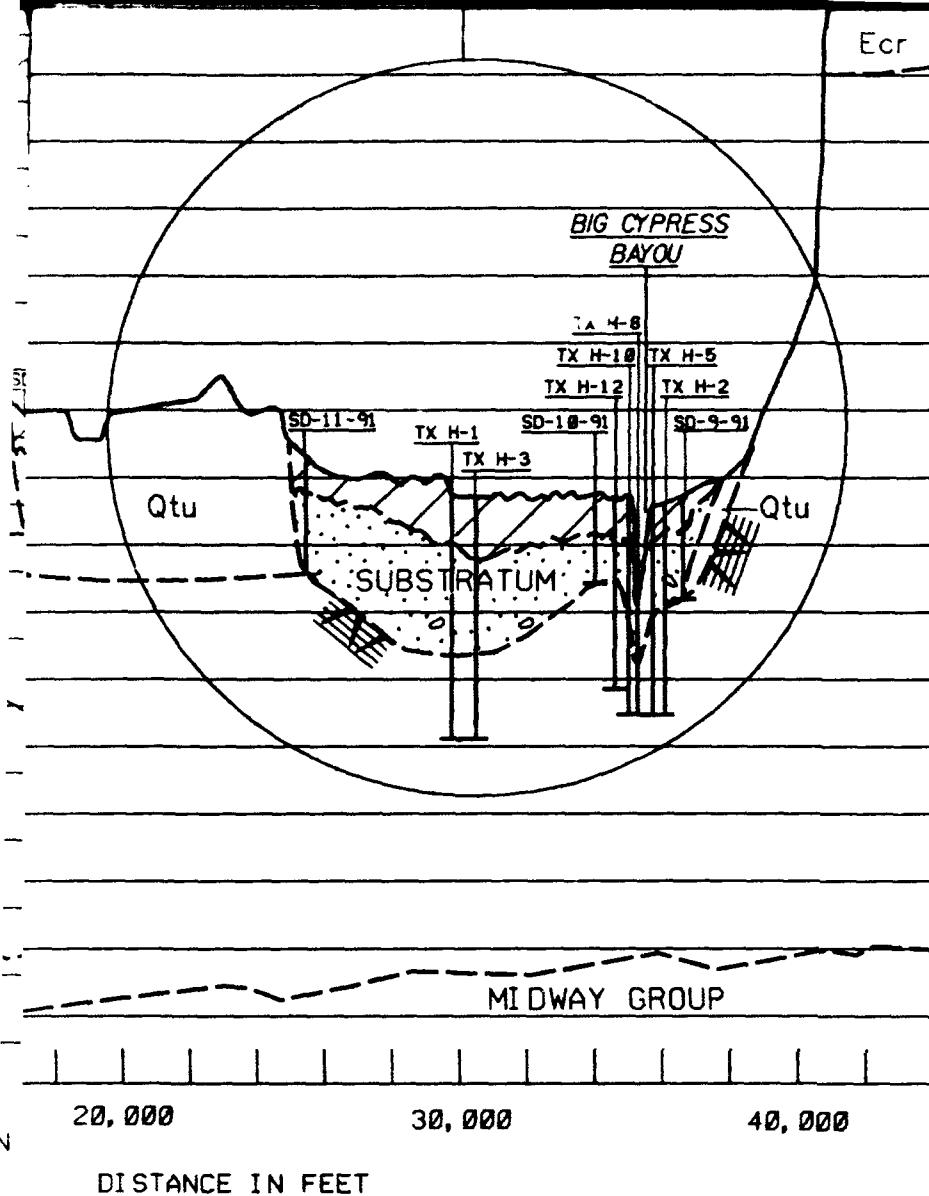
	NATURAL LEVEE
	POINT BAR
	BACKSWAMP
	ABANDONED CHANNEL
	ABANDONED COURSE

LITHOLOGY

	UNDIFFERENTIATED SAND AND GRAVEL
	SAND
	SILTY SAND
	SILT
	SANDY CLAY
	CLAY
	SHALE
	FILL

MAPPING SYMBOLS

	ALLUVIUM UNDIFF.
	TERRAE DEPOSITS UNDIFF.
	TERTIARY SURFACE
	SPARTA
	WECHES
	QUEEN CITY
	REKLAW
	WILCOX UNDIFF.



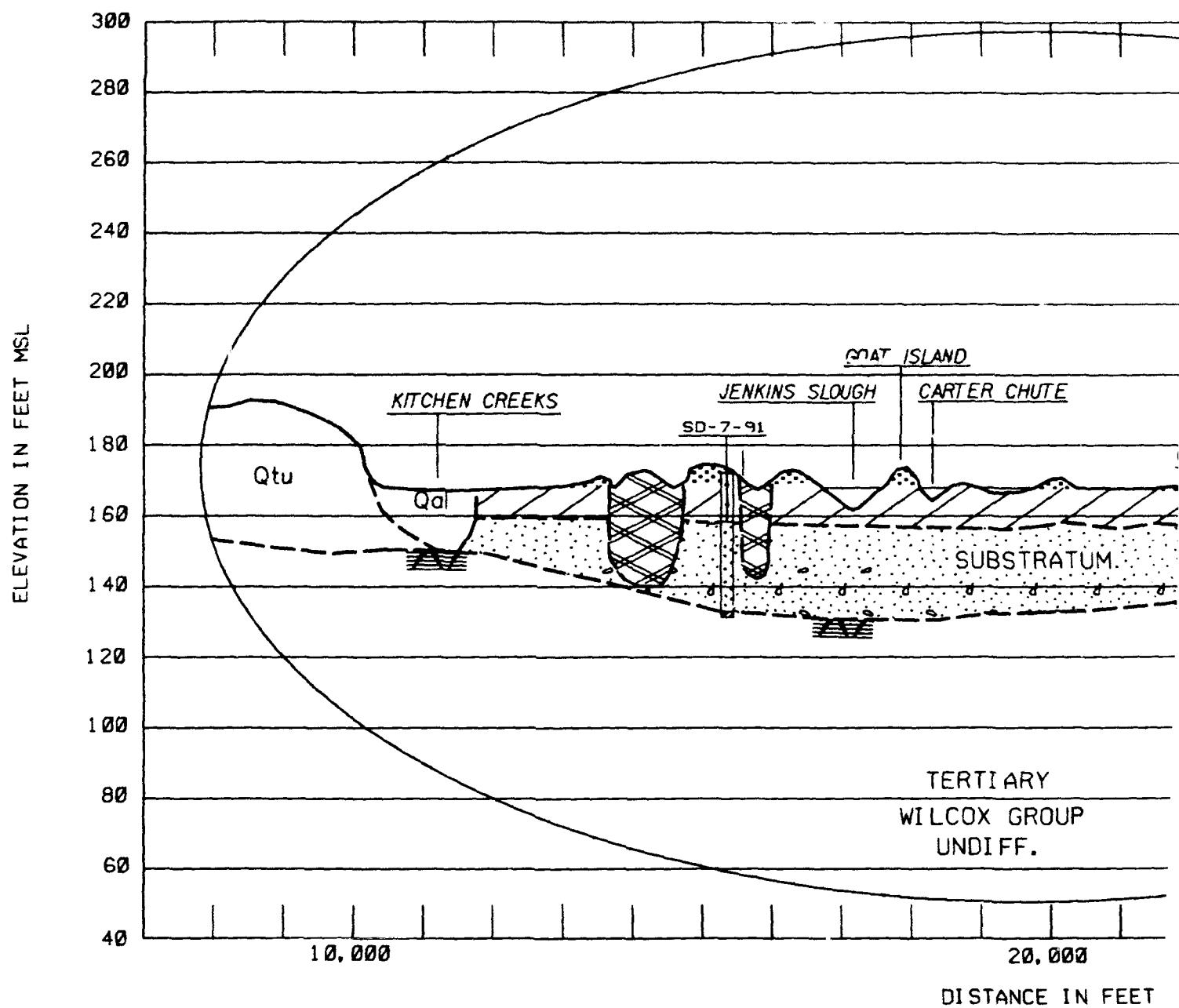
GEOLOGICAL INVESTIGATION

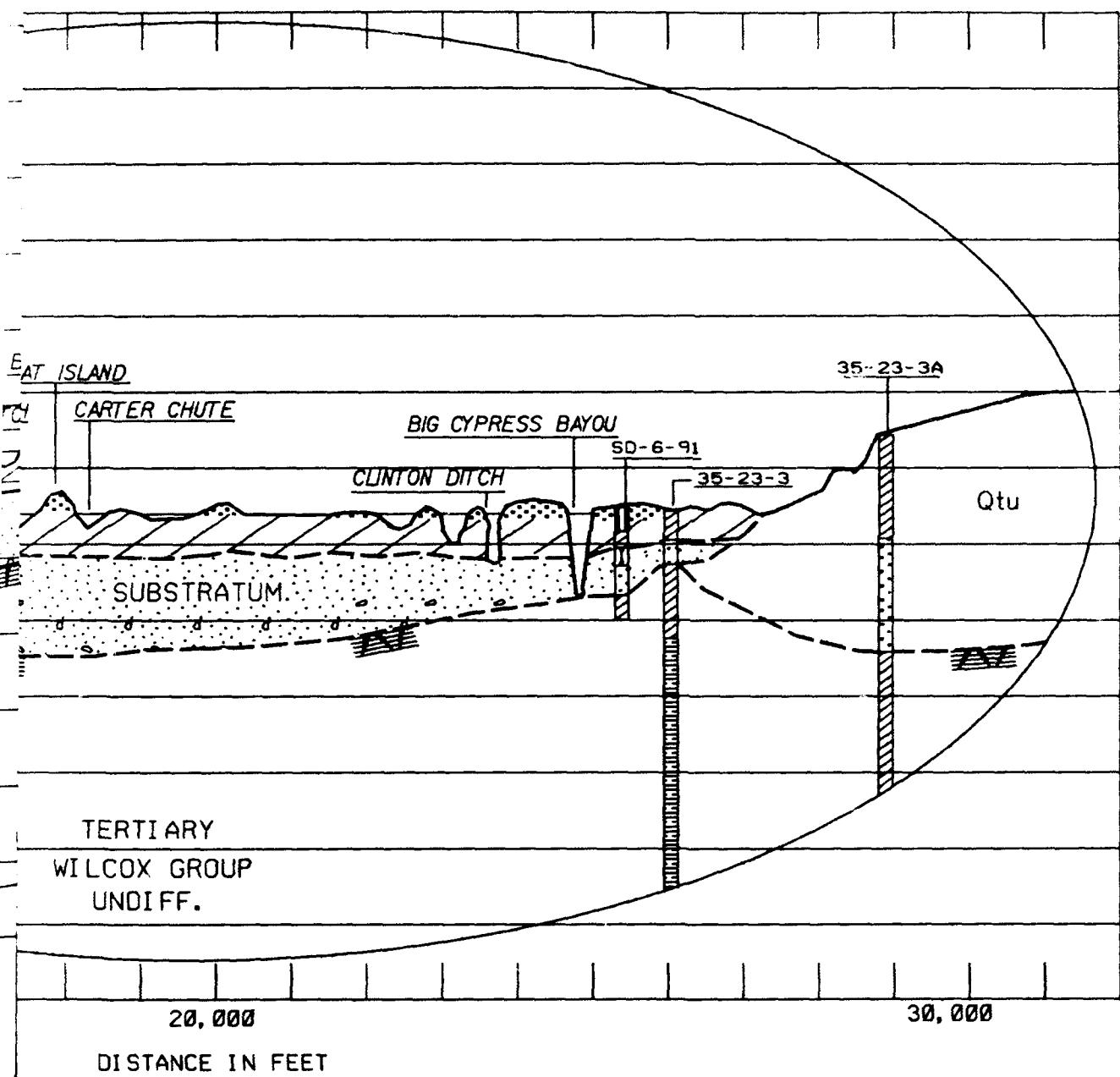
SHREVEPORT, LA - DAINGERFIELD, TX

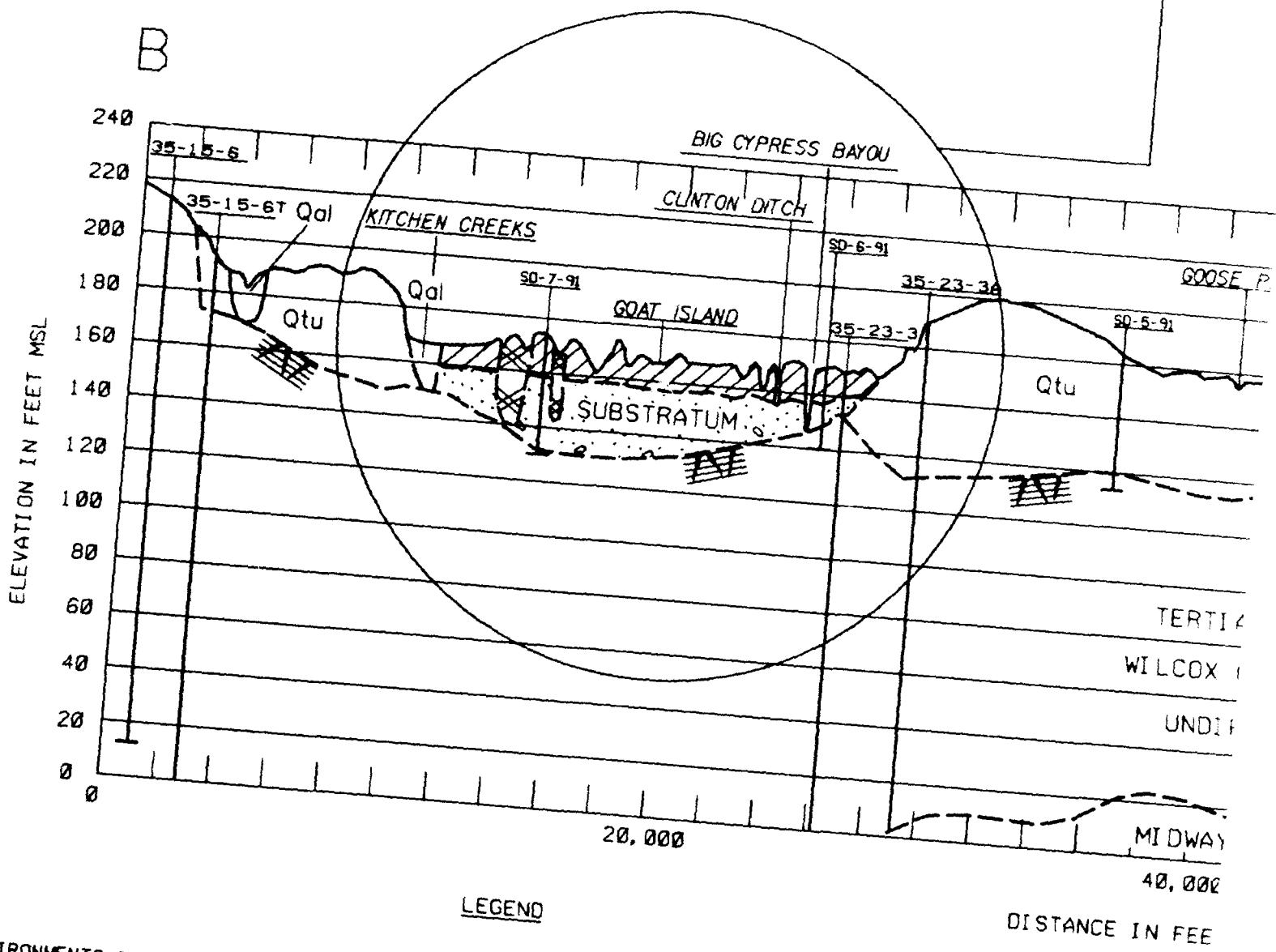
SECTION A - A'

CADDO

(HIGHWAY 43)







ENVIRONMENTS OF DEPOSITION

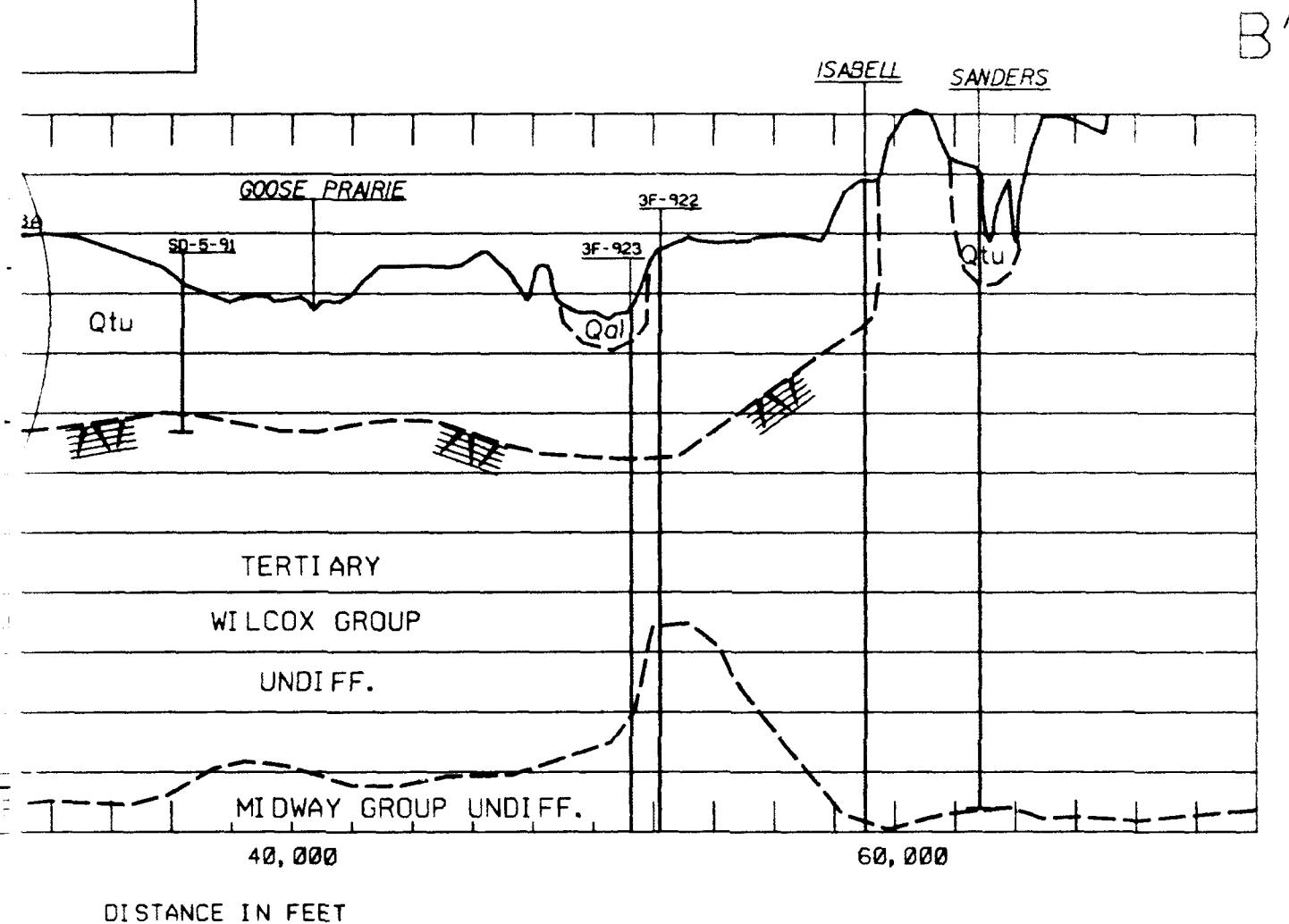
- [Natural Levee Pattern] NATURAL LEVEE
- [Point Bar Pattern] POINT BAR
- [Backswamp Pattern] BACKSWAMP
- [Abandoned Channel Pattern] ABANDONED CHANNEL
- [Abandoned Course Pattern] ABANDONED COURSE

LITHOLOGY

- [S: S Pattern] UNDIFFERENTIATED SAND AND GRAVEL
- [Dotted Pattern] SAND
- [Vertical Lines Pattern] SILTY SAND
- [Horizontal Lines Pattern] SILT
- [Cross-Hatch Pattern] SANDY CLAY
- [Diagonal Lines Pattern] CLAY
- [Horizontal Lines with Dots Pattern] SHALE
- [Dashed Pattern] FILL

MAPPING SYMBOLS

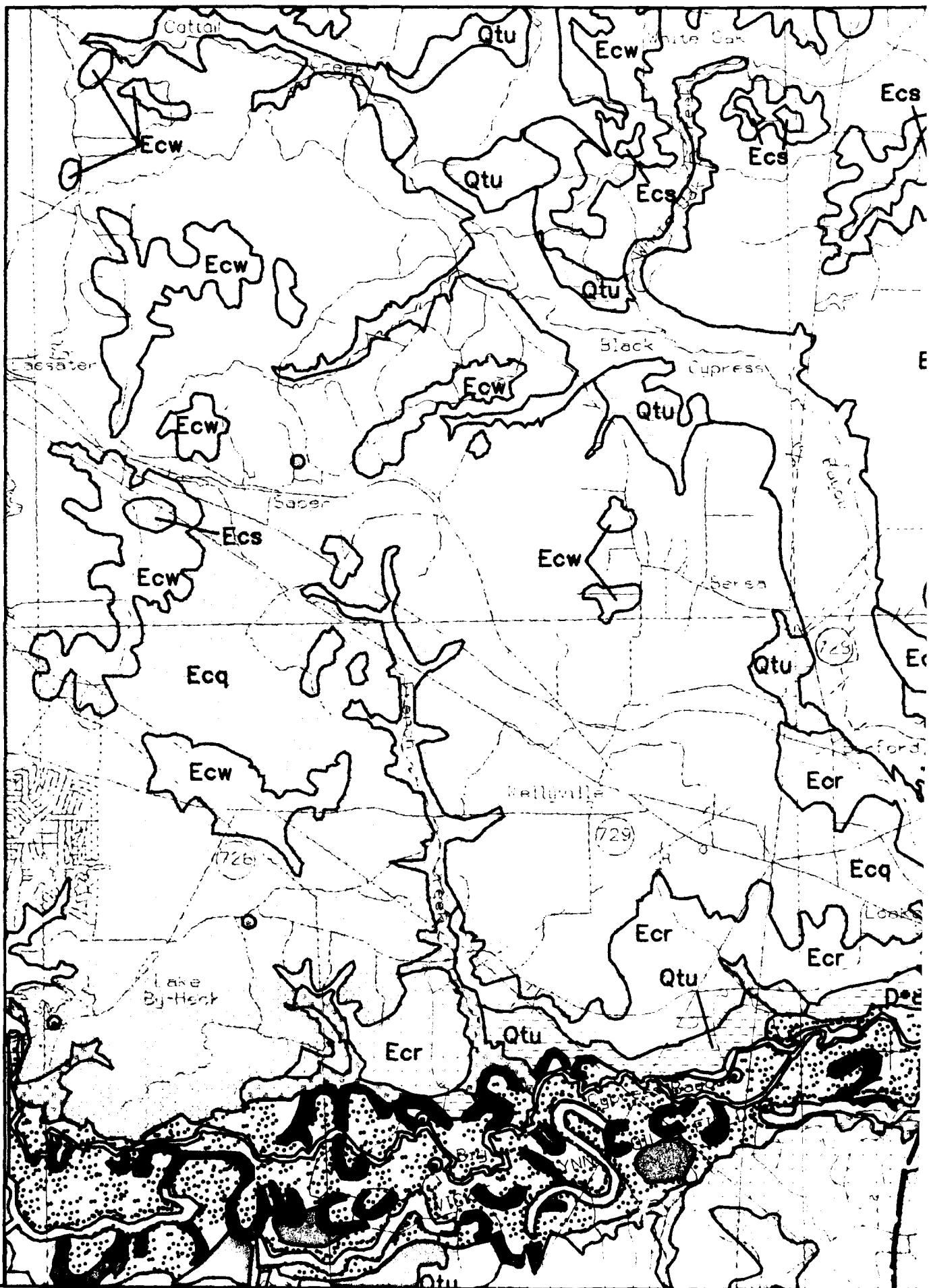
- [Box with Qal] QAL ALLUVIUM UNDIFF.
- [Box with Qtu] QTU TERRACE DEPOSITS UNDIFF.
- [Box with Hatching] TERTIARY SURFACE
- [Box with EOB] EOB SPARTA
- [Box with ECW] ECW WECHE
- [Box with EQG] EQG QUEEN CITY
- [Box with ECP] ECP REKLAW
- [Box with EWU] EWU WILCOX UNDIFF.



GEOLOGICAL INVESTIGATION
 SHREVEPORT, LA - DANGERFIELD, TX
 SECTION B - B'
 CADDO
 (LONGHORN)

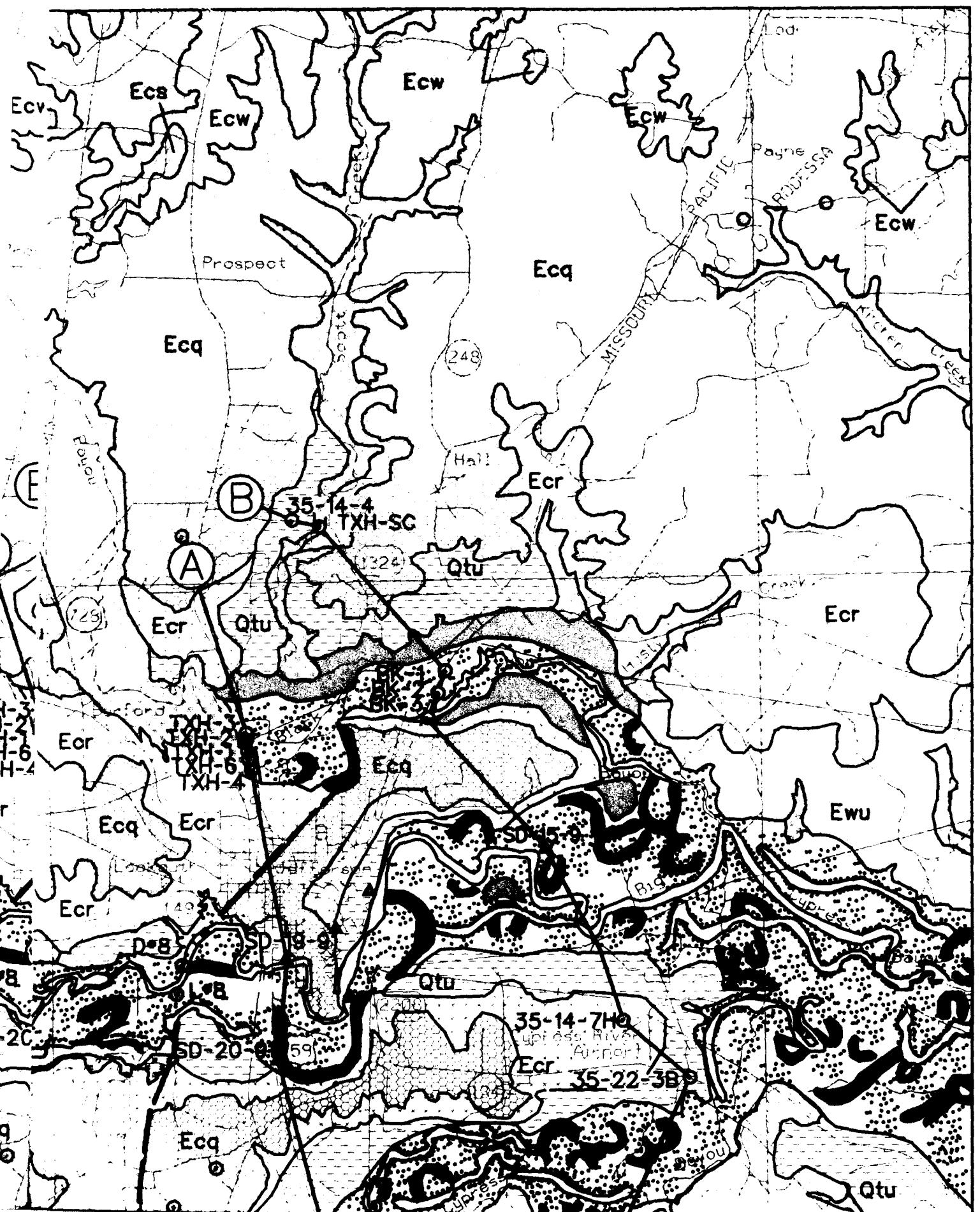
94° 30'

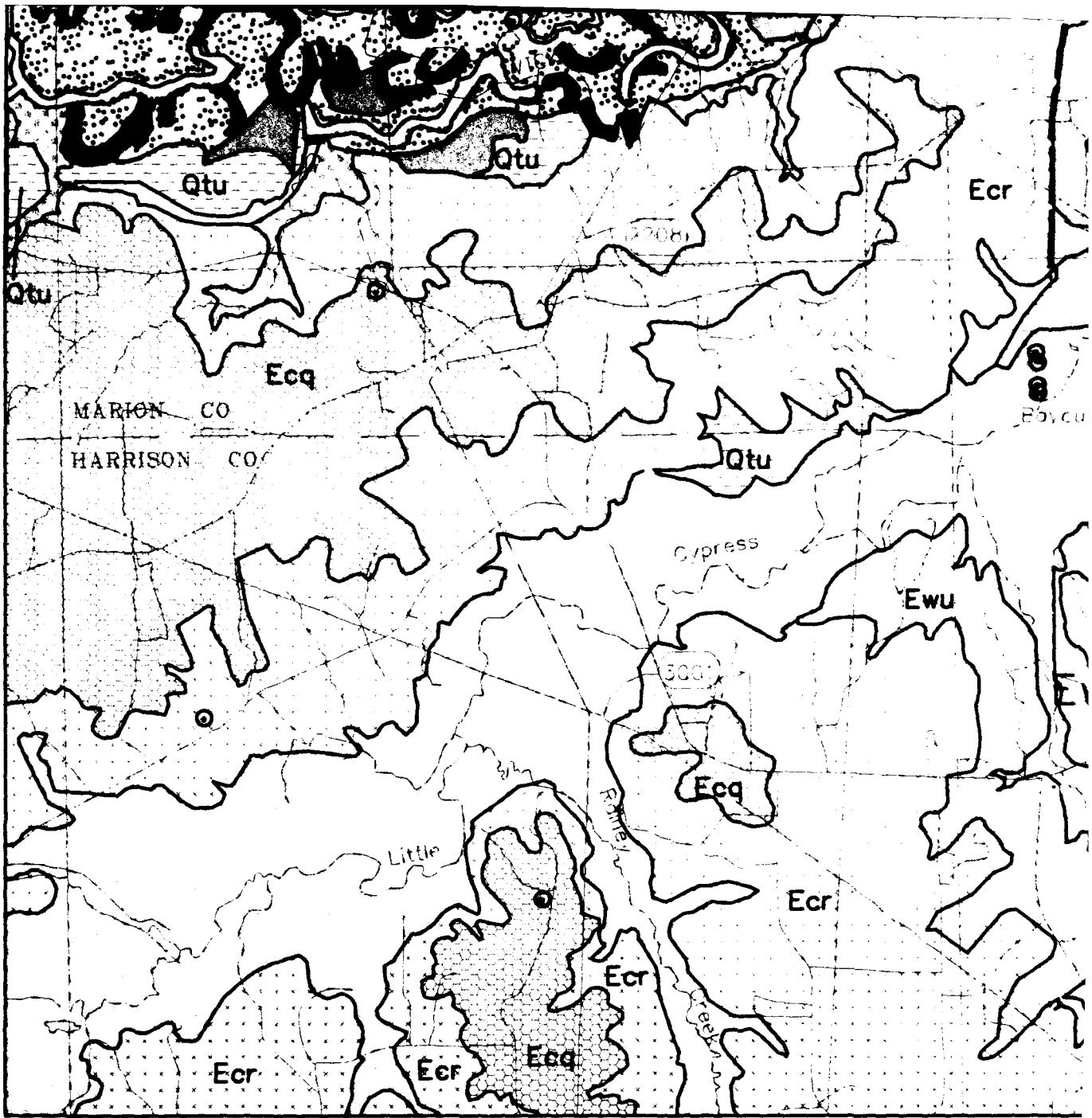
32° 52' 30"



94° 15'

32° 52





32° 37' 30"

94° 30'

LEGEND

QUARTERNARY

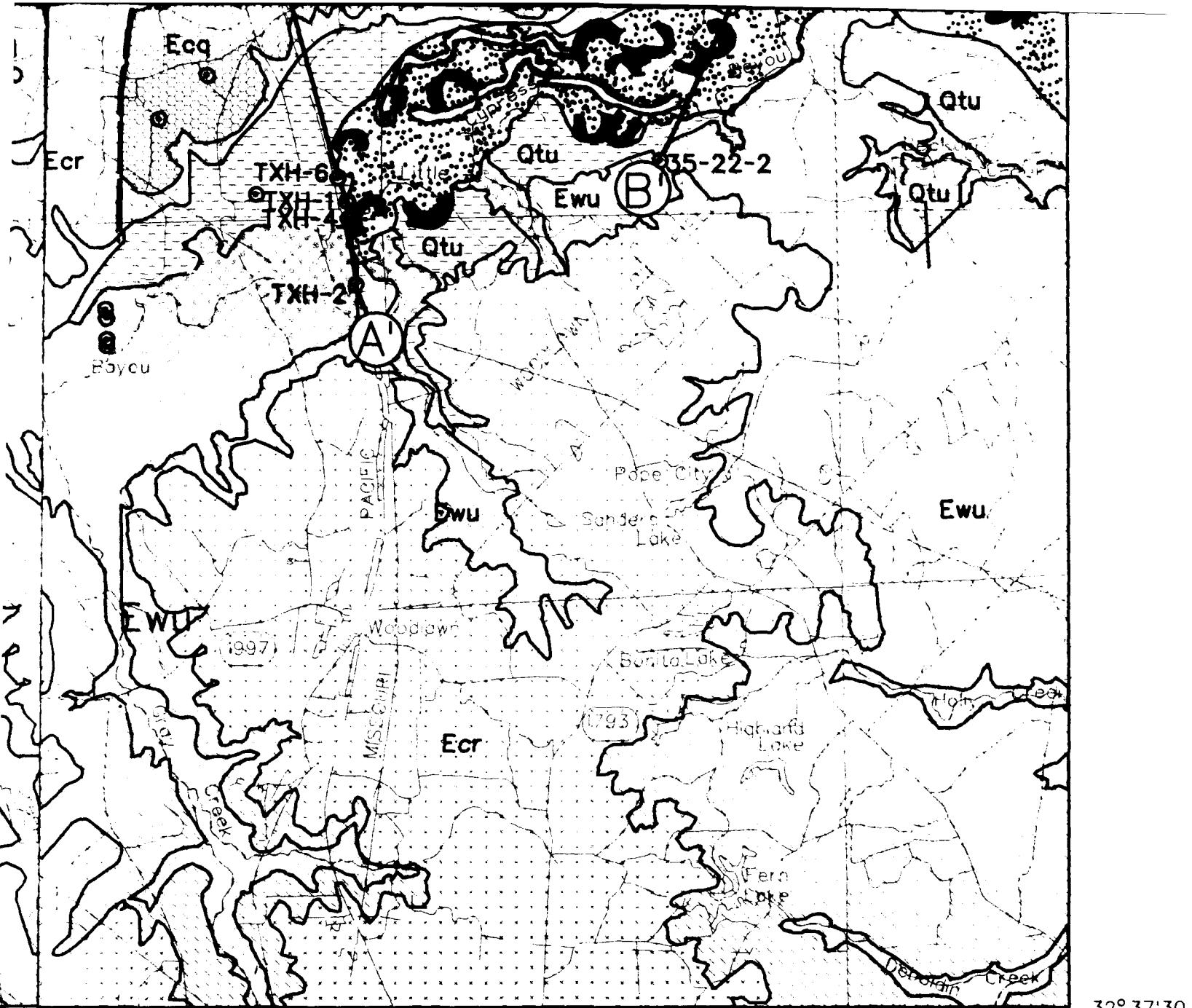
RECENT
 NATURAL LEVEE
 POINT BAR
 BACKSWAMP
 ABANDONED CHANNEL
 ABANDONED COURSE
 UNDIFFERENTIATED ALLUVIUM

TERTIARY

EOCENE
CLAIBORNE GROUP
Ecs SPARTA FORMATION
Ecw WECHES FORMATION
Eer QUEEN CITY FORMATION
Eer REKLAW FORMATION
Ewu WILCOX GROUP UNDIFFERENTIATED

PLEISTOCENE

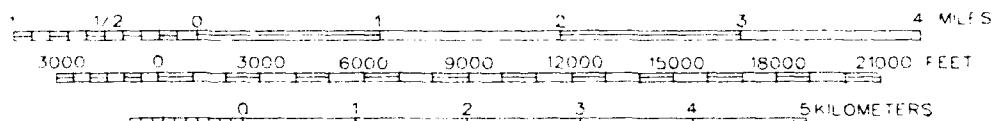
Q4a UNDIFFERENTIATED TERRACE DEPOSITS



32° 37' 30"

94° 15'

SCALE 1:625000

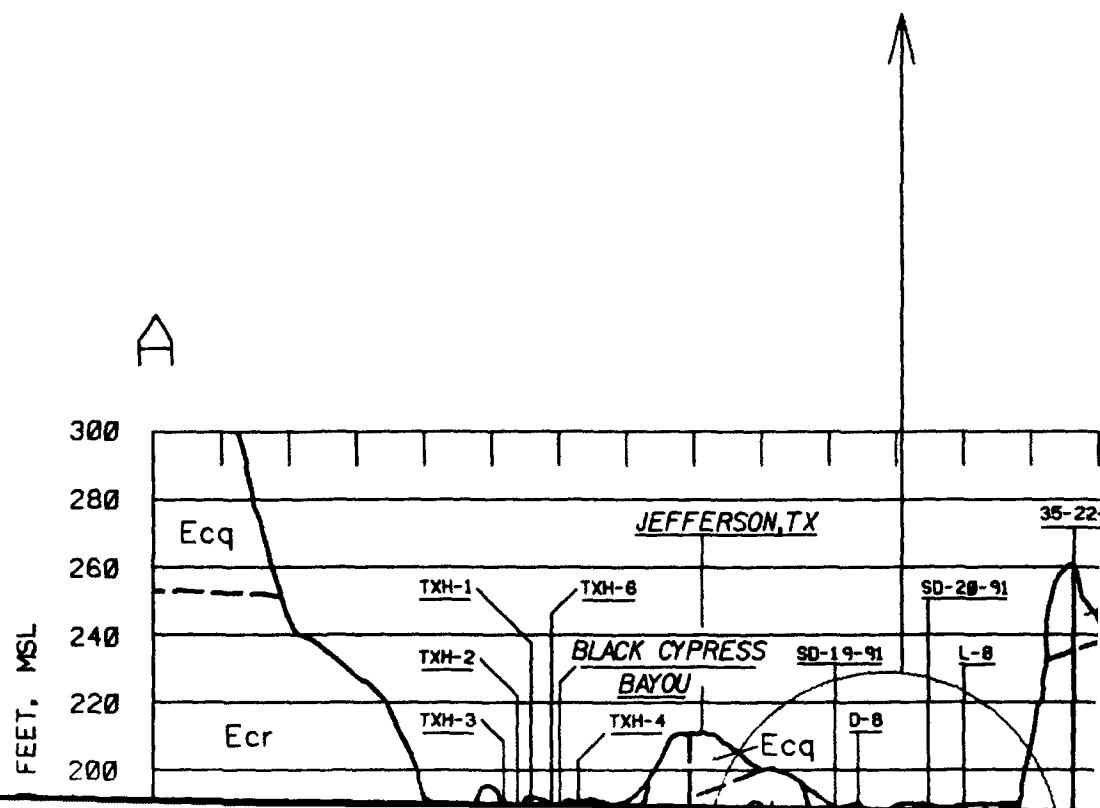
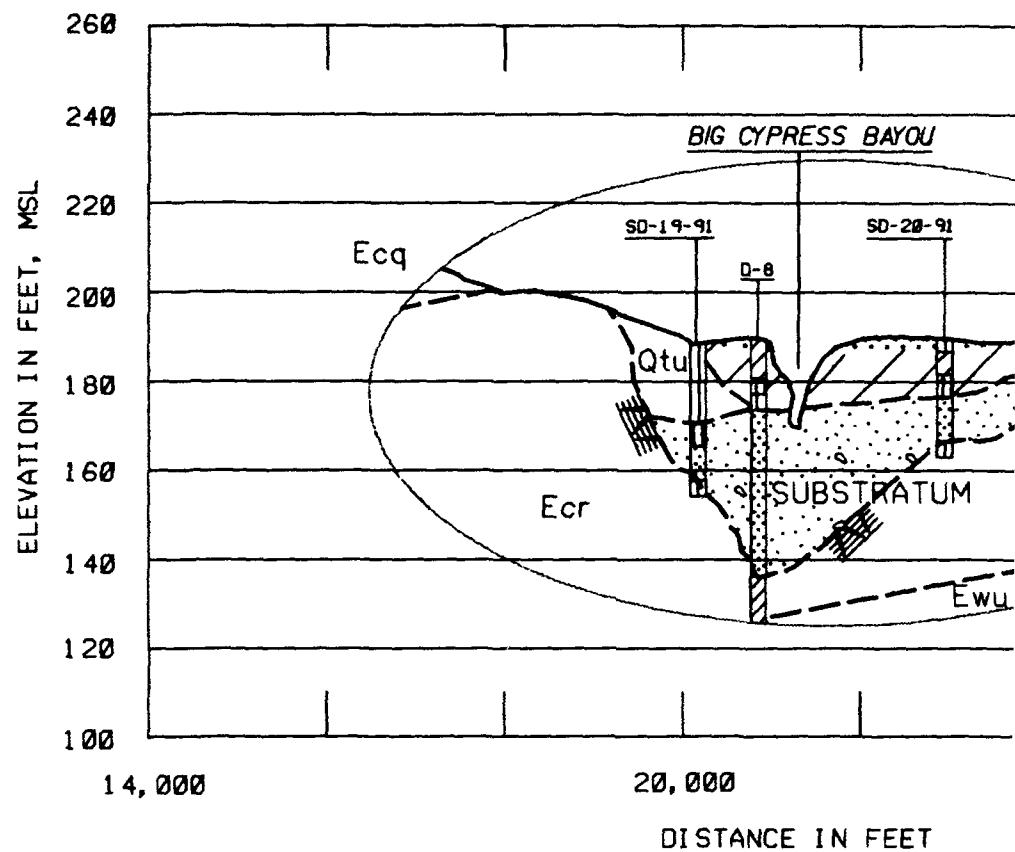


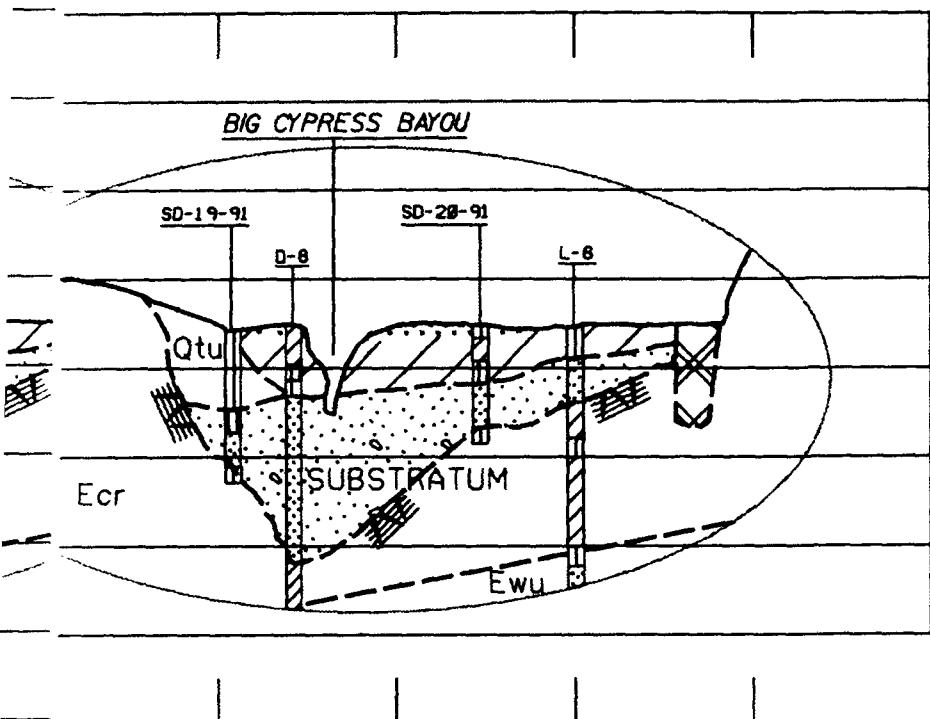
SHREVEPORT, LA - DANGERFIELD, TX

SURFACE GEOLOGY

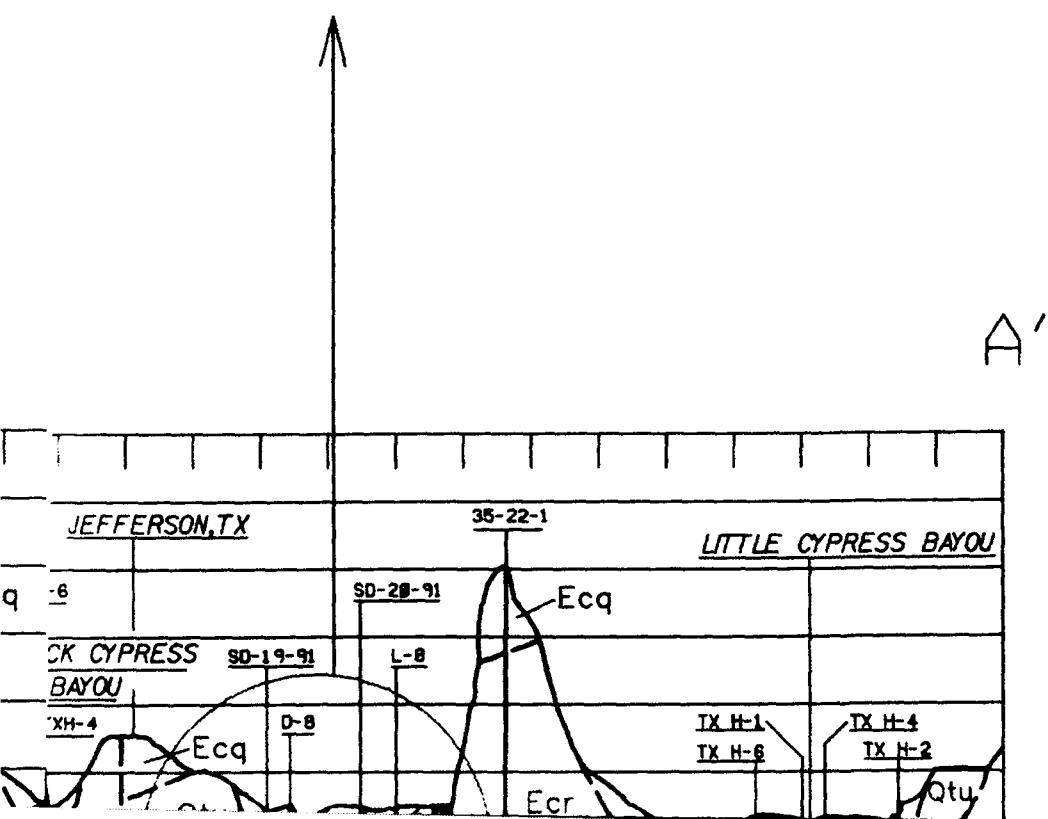
JEFFERSON, TX

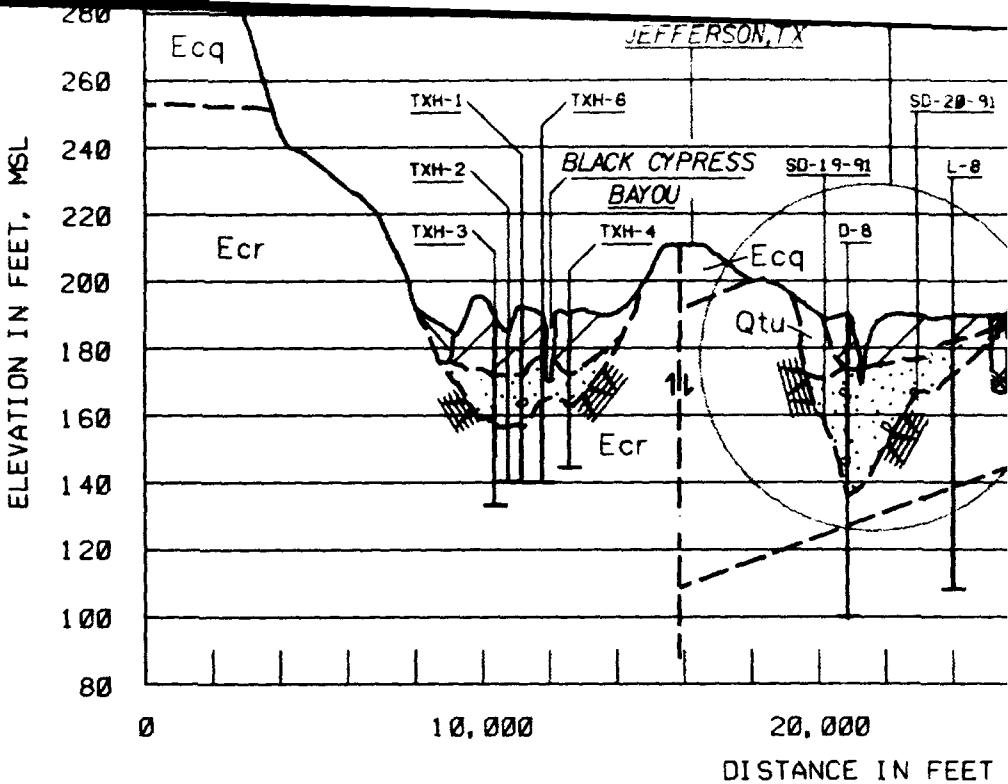
2/92





DISTANCE IN FEET





LEGEND

ENVIRONMENTS OF DEPOSITION

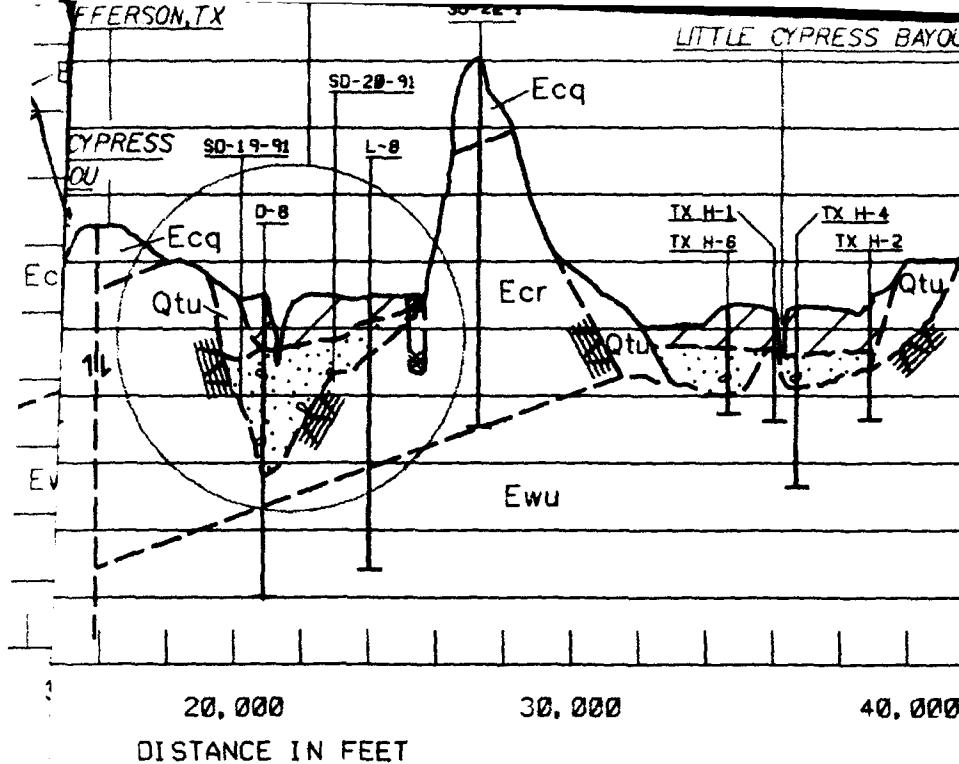
	NATURAL LEVEE
	POINT BAR
	BACKSWAMP
	ABANDONED CHANNEL
	ABANDONED COURSE

LITHOLOGY

	UNDIFFERENTIATED SAND AND GRAVEL
	SAND
	SILTY SAND
	SILT
	SANDY CLAY
	CLAY
	SHALE
	FILL

MAPPING SYMBOLS

	ALLUVIUM UNDIFF.
	TERRACE DEPOSITS UNDIFF.
	TERTIARY SURFACE
	SPARTA
	MECHES
	QUEEN CITY
	REKLAW
	WILCOX UNDIFF.



SYMBOLS

VIMUM
FF.

ACE DEPOSITS
FF.

TIARY SURFACE

RTA

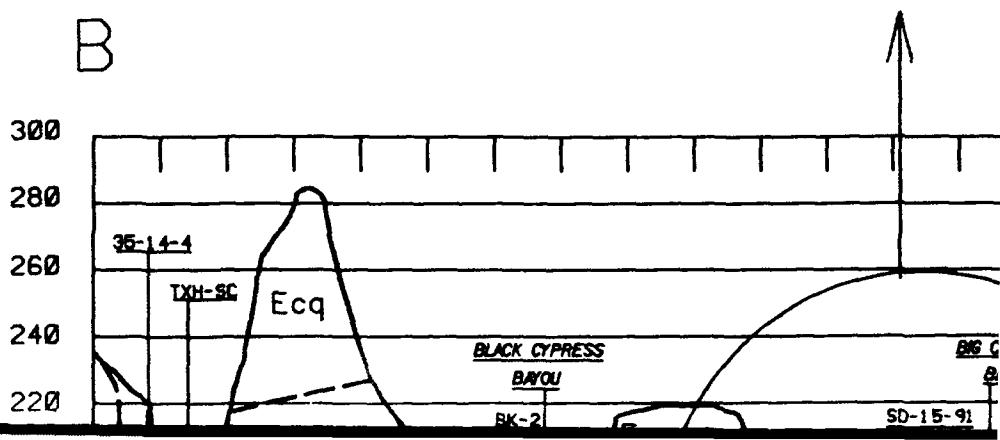
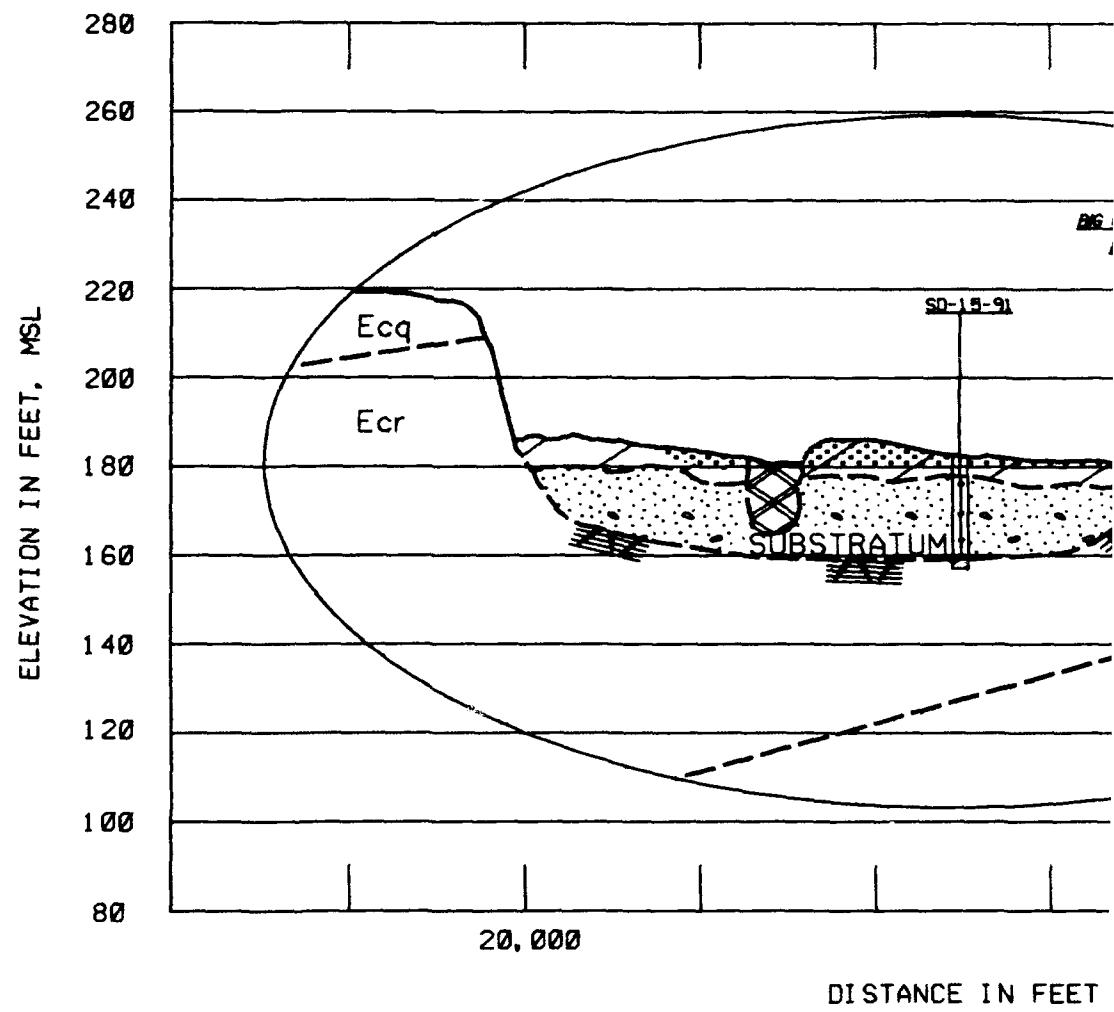
MES

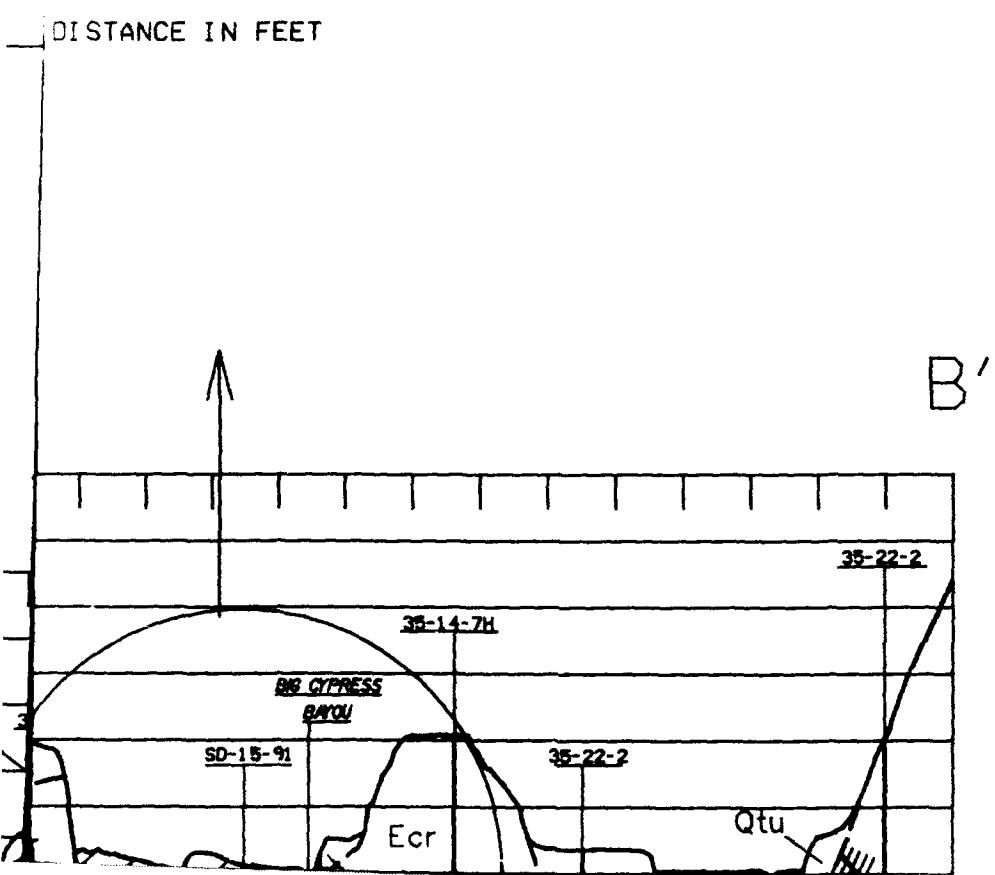
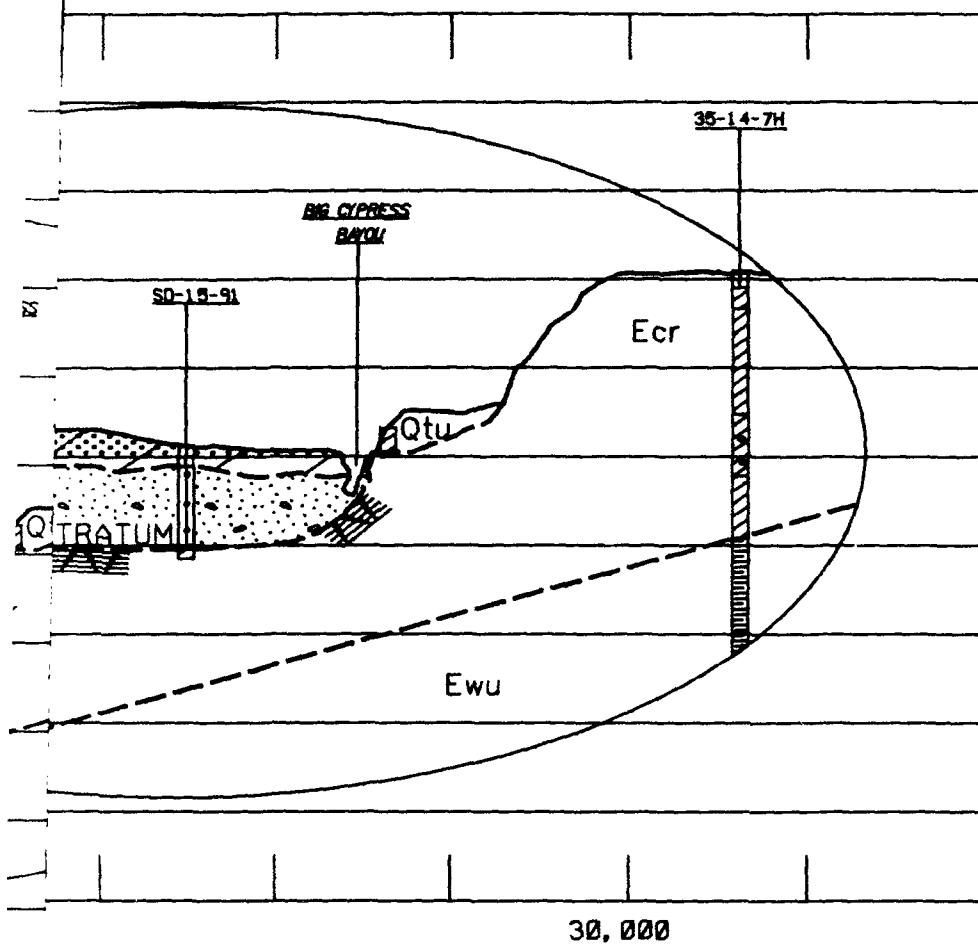
EN CITY

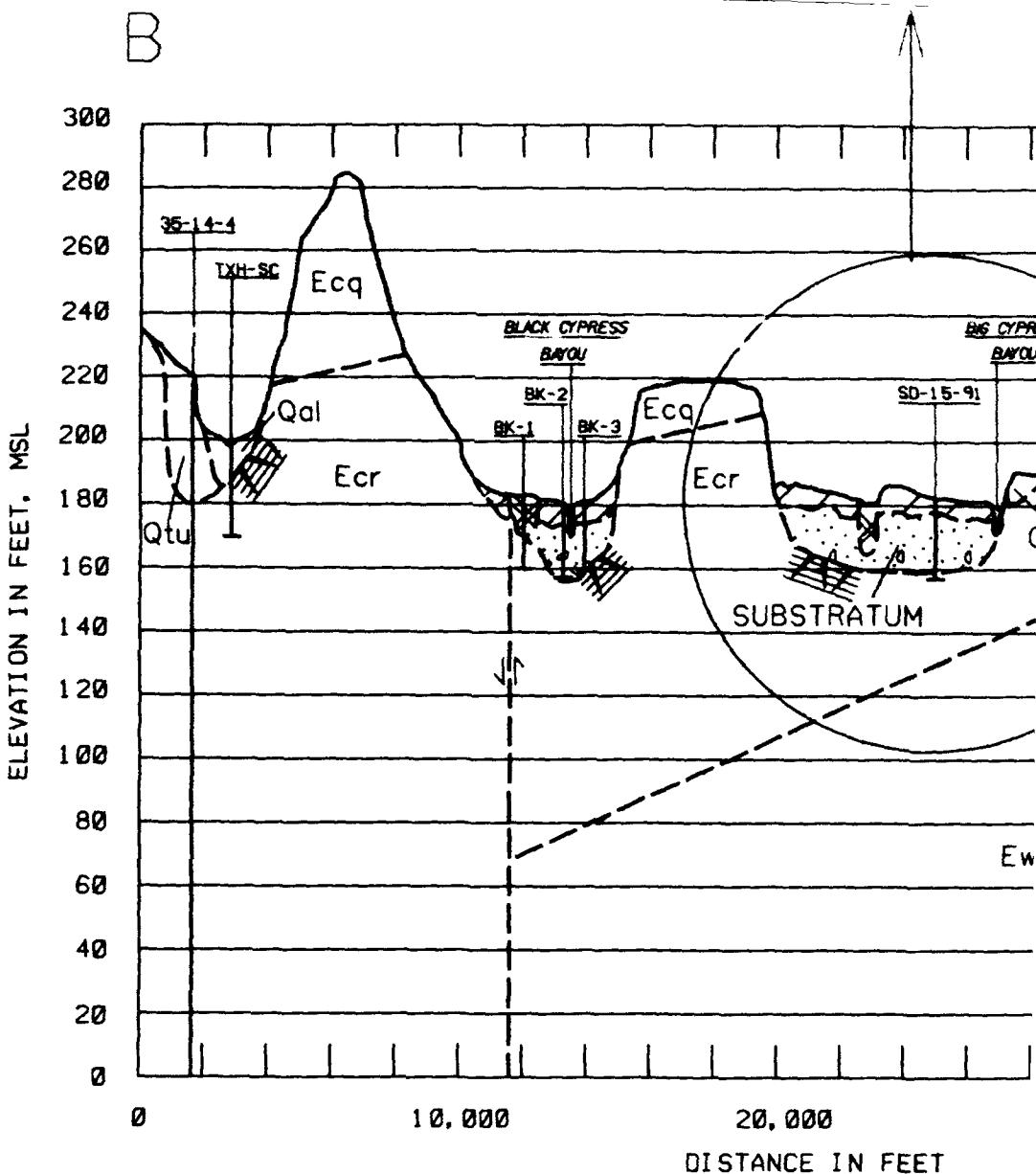
LAW

COX UNDIFF.

GEOLOGICAL INVESTIGATION
SHREVEPORT, LA - DANGERFIELD, TX
SECTION A - A'
JEFFERSON
(HIGHWAY 59)







LEGEND

ENVIRONMENTS OF DEPOSITION

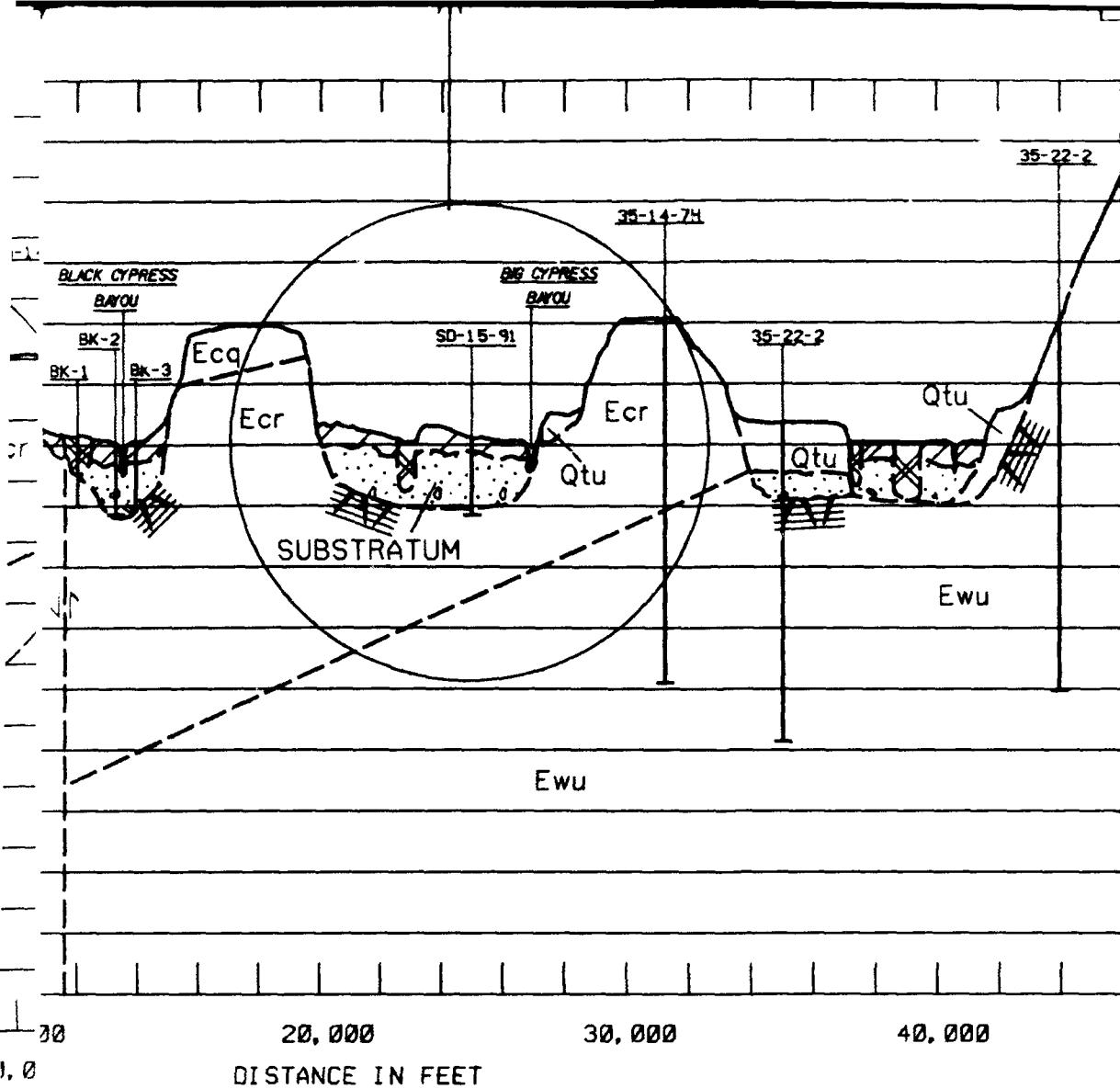
	NATURAL LEVEE
	POINT BAR
	BACKSWAMP
	ABANDONED CHANNEL
	ABANDONED COURSE
	UNDIFFERENTIATED SAND AND GRAVEL

LITHOLOGY

	SAND
	SILTY SAND
	SILT
	SANDY CLAY
	CLAY
	SHALE

MAPPING SYMBOLS

	TERRACE DEPOSITS UNDIFF.
	TERTIARY SURFACE
	SPARTA
	MECHES
	QUEEN CITY
	REKLAW
	WILCOX UNDIFF.

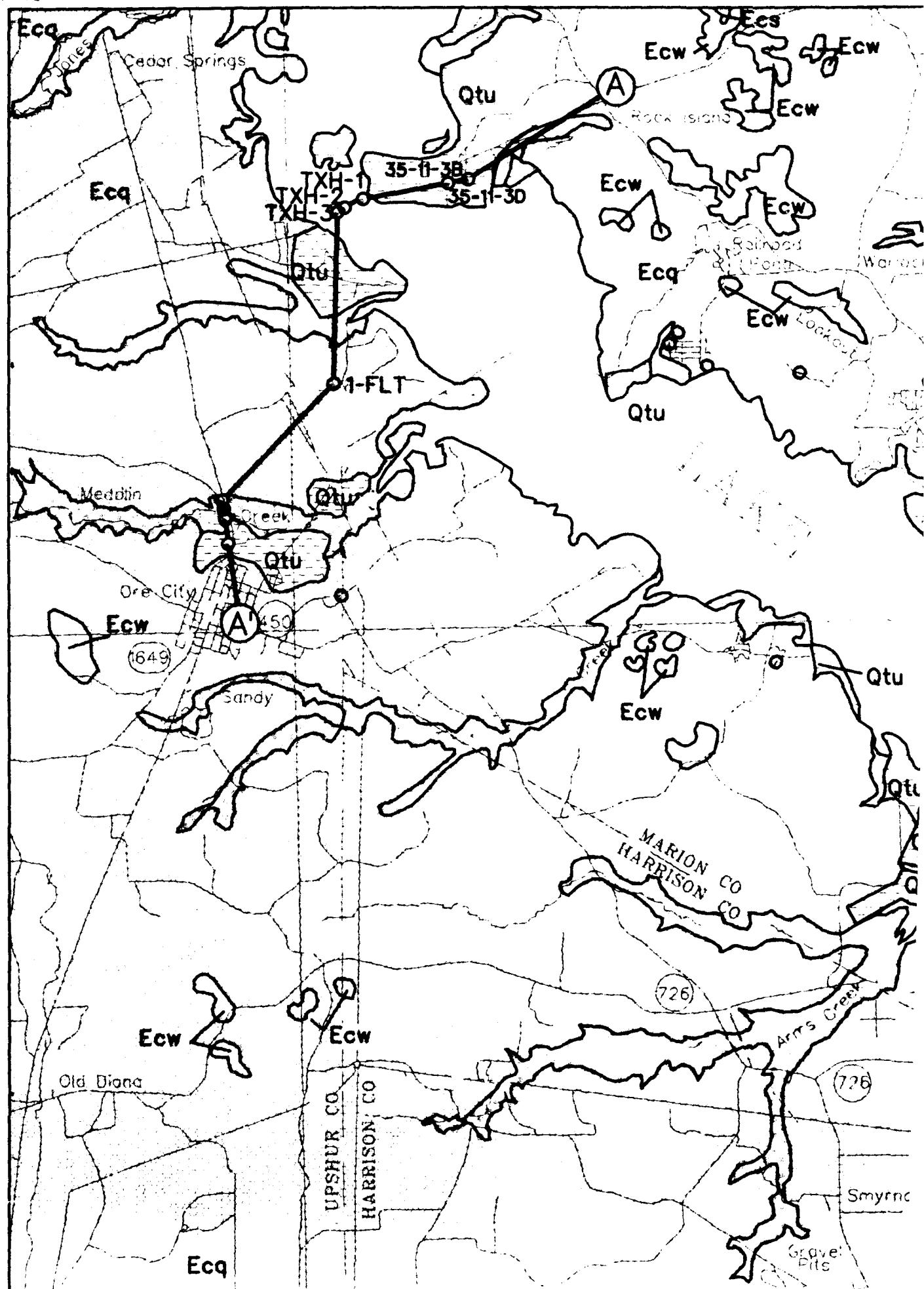


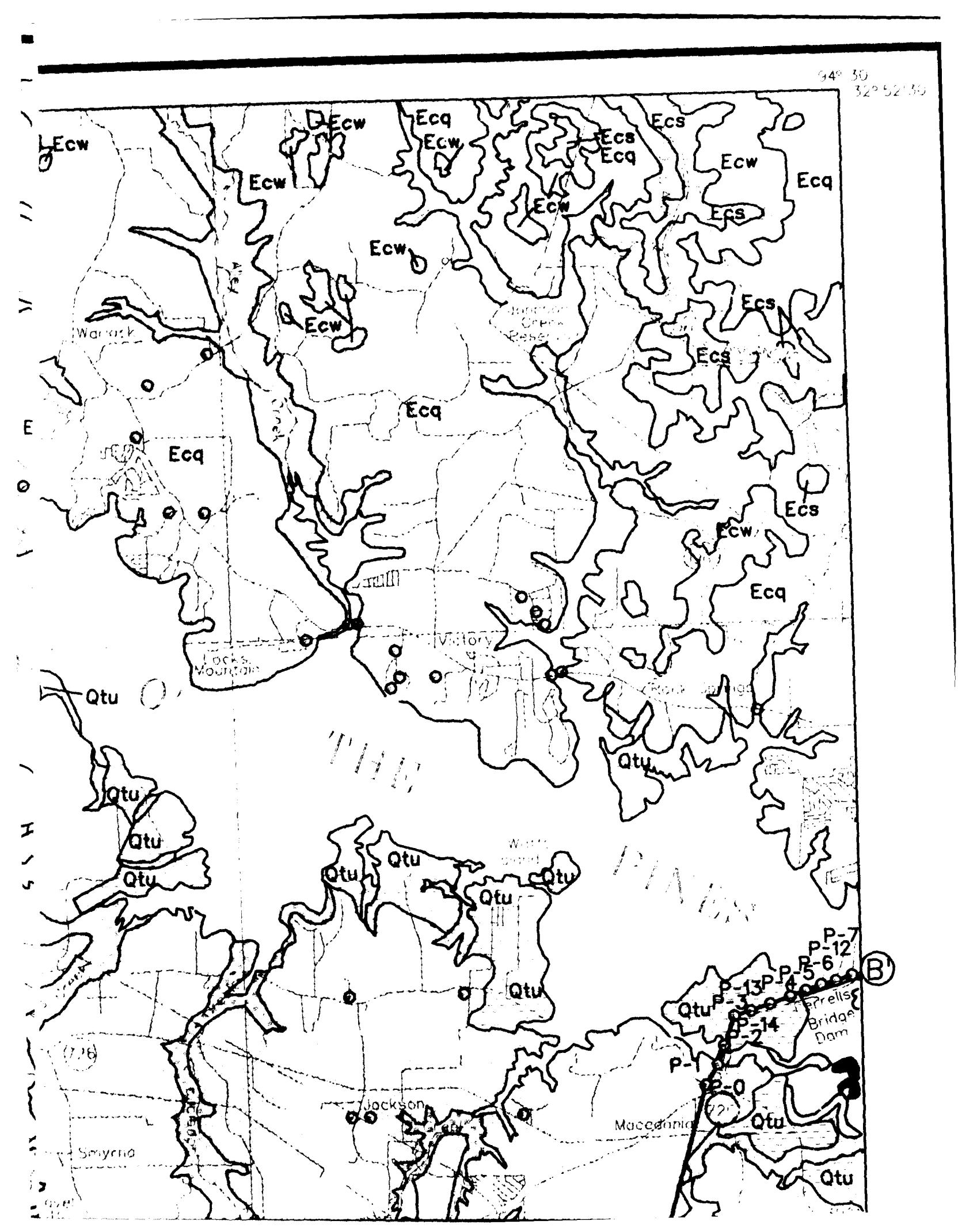
MAPPING SYMBOLS

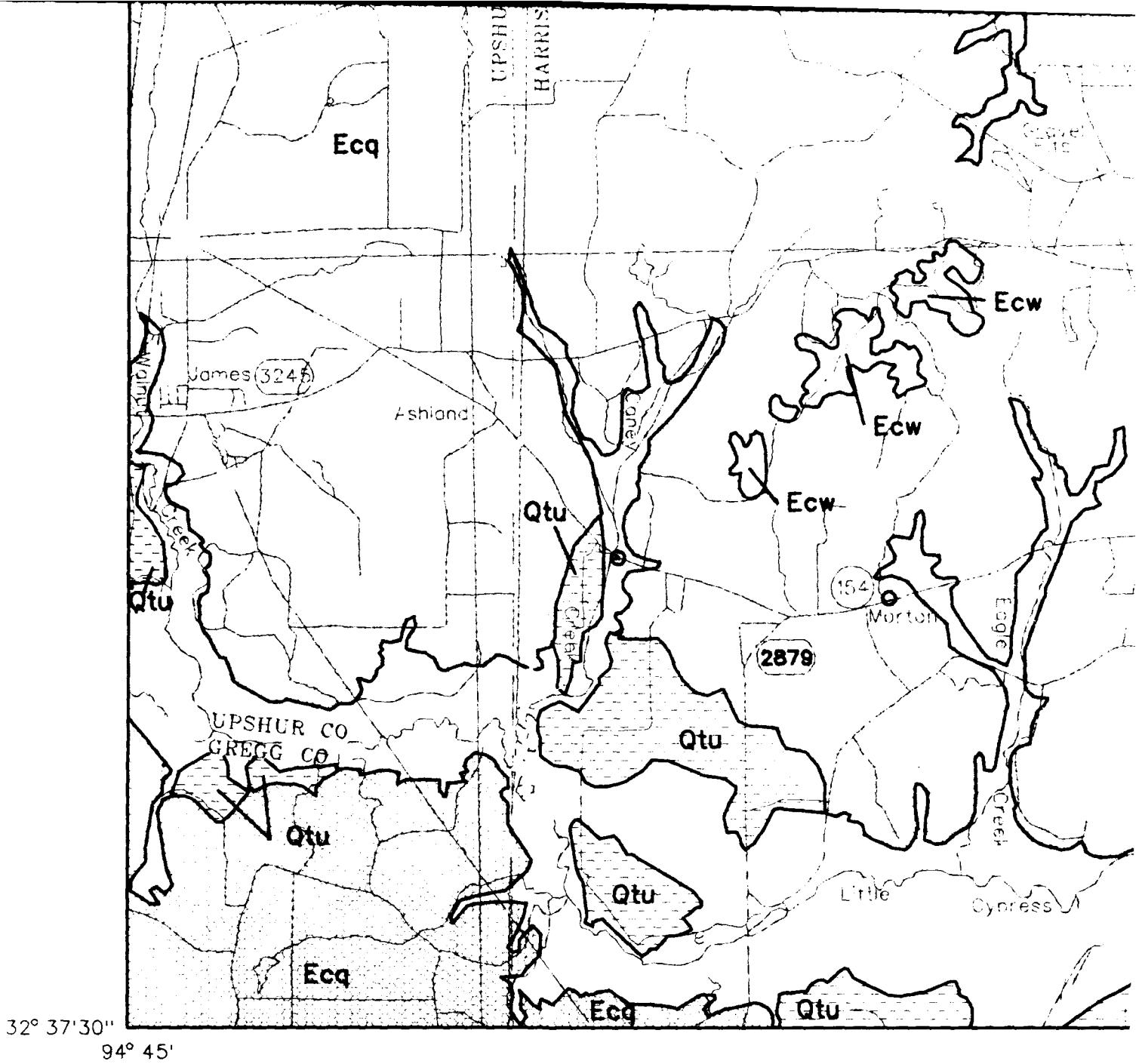
Qtu	TERRACE DEPOSITS UNDIFF.
	TERTIARY SURFACE
Eos	SPARTA
Eow	WECHES
Ecq	QUEEN CITY
Eor	REKLAW
Ewu	WILCOX UNDIFF.

GEOLOGICAL INVESTIGATION
 SHREVEPORT, LA - DANGERFIELD, TX
 SECTION B - B'
 JEFFERSON
 (WOODLAWN OIL FIELD)

32° 52' 30" 94° 45'







LEGEND

QUARTERNARY

RECENT

- NATURAL LEVEE
- POINT BAR
- BACKSWAMP
- ABANDONED CHANNEL
- ABANDONED COURSE
- UNDIFFERENTIATED ALLUVIUM

PLEISTOCENE

- Qtu UNDIFFERENTIATED TERRACE DEPOSITS

TERTIARY

EOCENE

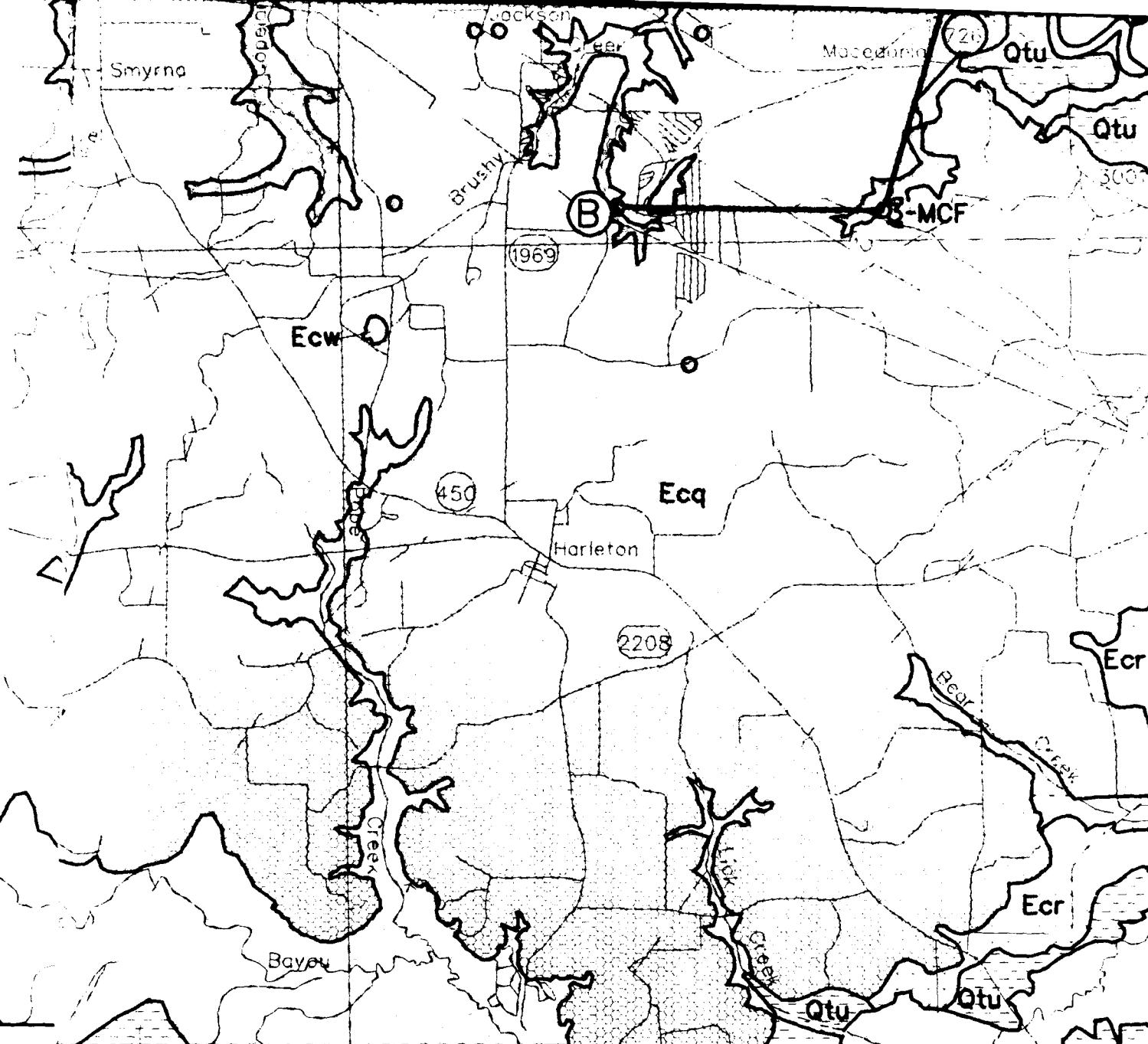
- CLAIBORNE GROUP
 - Ecs SPARTA FORMATION
 - Ecw WECHES FORMATION
 - Qcf QUEEN CITY FORMATION
 - Rek REKLAU FORMATION
 - Wil WILCOX GROUP UNDIFFERENTIATED

— CONTACT

— — FAULT

○ BORING

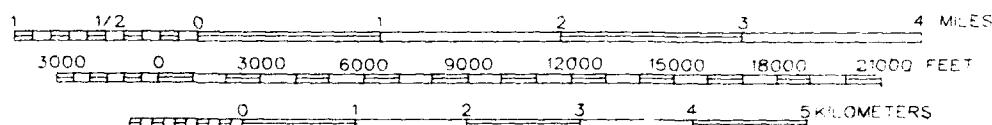
△ PIEZOMETER



32° 37'

94° 30'

SCALE 1:625000

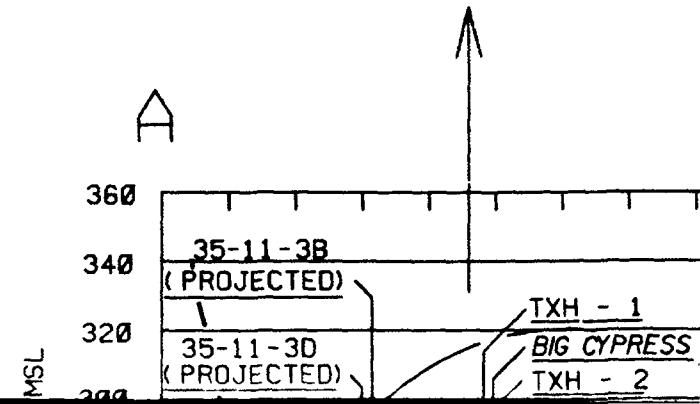
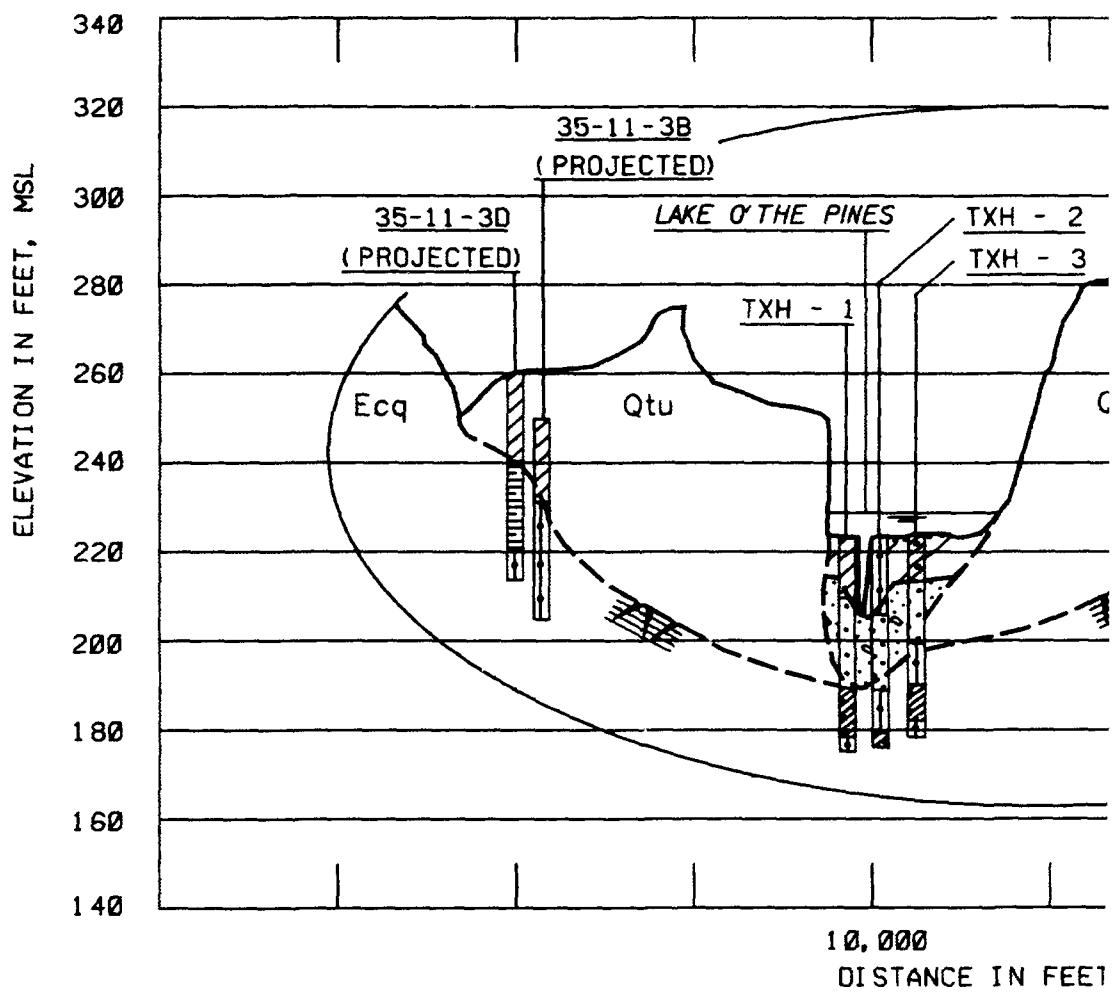


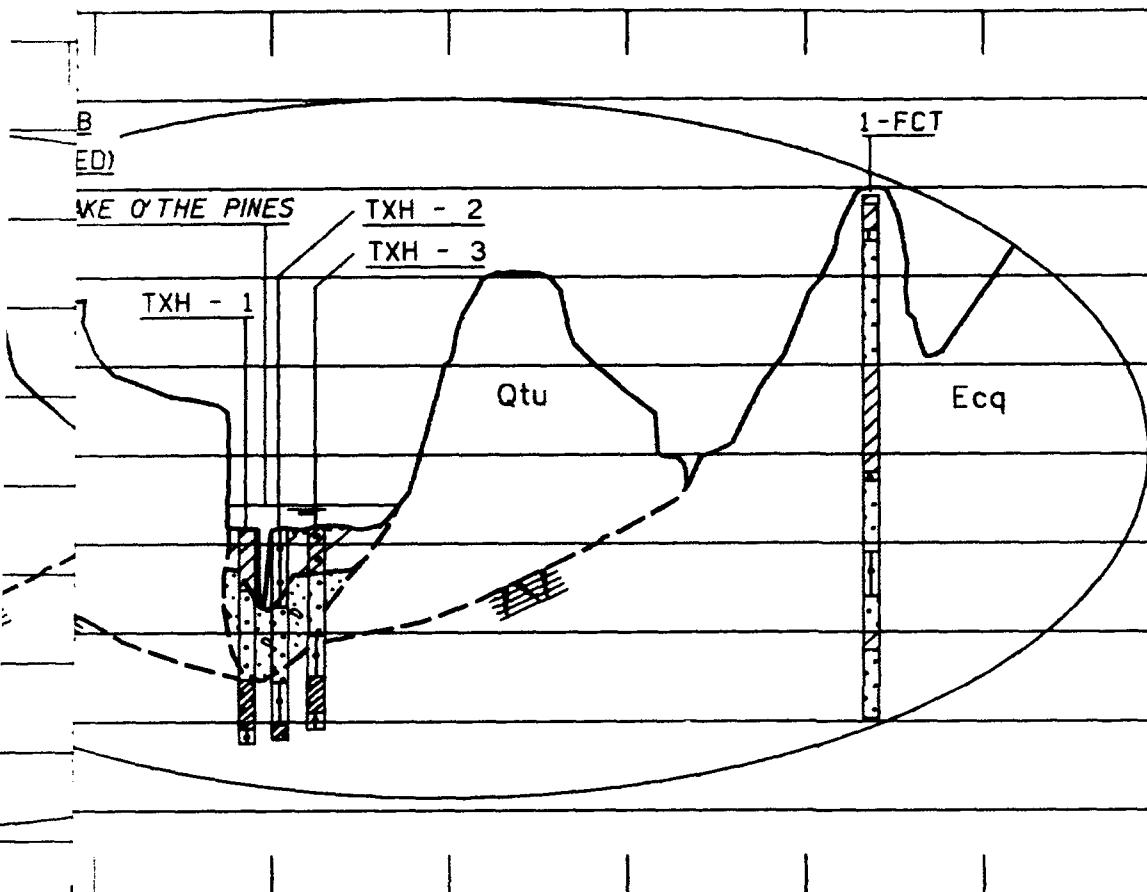
SHREVEPORT, LA - DANGERFIELD, TX

SURFACE GEOLOGY

LAKE O' THE PINES, TX

2/92



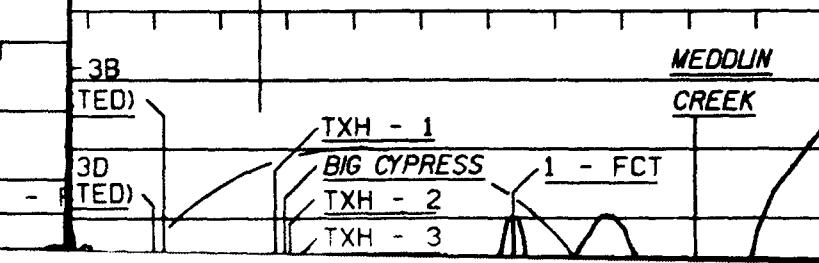


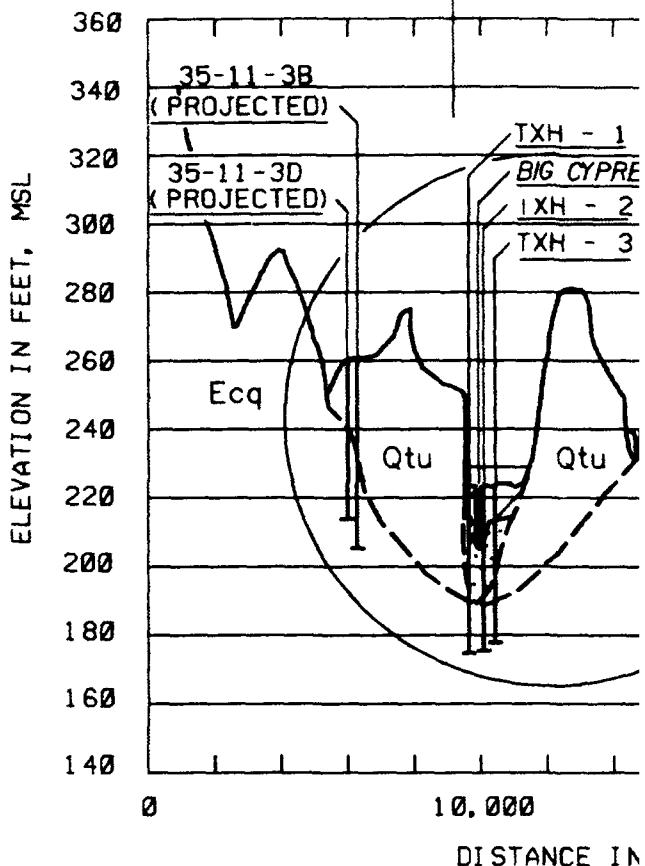
10,000

DISTANCE IN FEET

20,000

A'





LEGEND

ENVIRONMENTS OF DEPOSITION

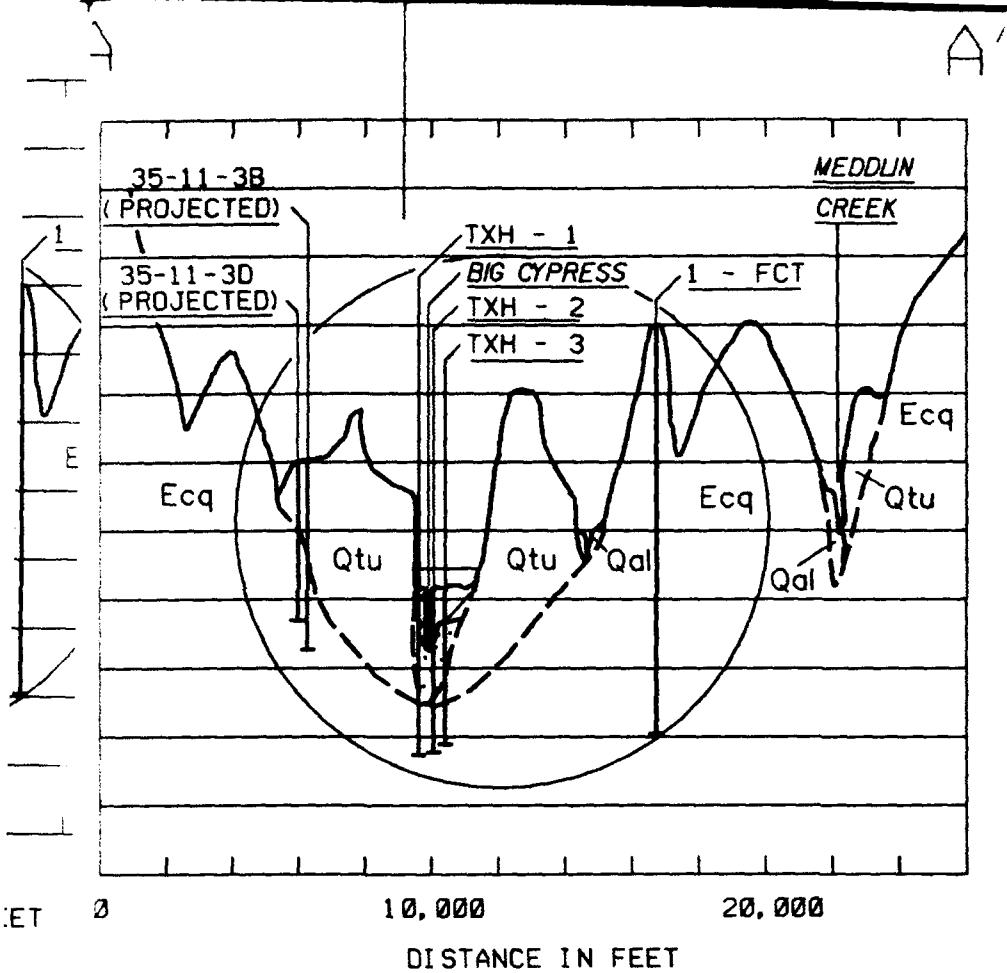
- [Dotted pattern] NATURAL LEVEE
- [Diagonal lines] POINT BAR
- [Cross-hatch] BACKSWAMP
- [Cross-hatch with diagonal lines] ABANDONED CHANNEL
- [Cross-hatch with diagonal lines] ABANDONED COURSE

LITHOLOGY

- [S::S] UNDIFFERENTIATED SAND AND GRAVEL
- [Dotted pattern] SAND
- [Vertical lines] SILTY SAND
- [Horizontal lines] SILT
- [Cross-hatch] SANDY CLAY
- [Diagonal lines] CLAY
- [Horizontal lines] SHALE
- [Two triangles] FILL

MAPPING SYMBOLS

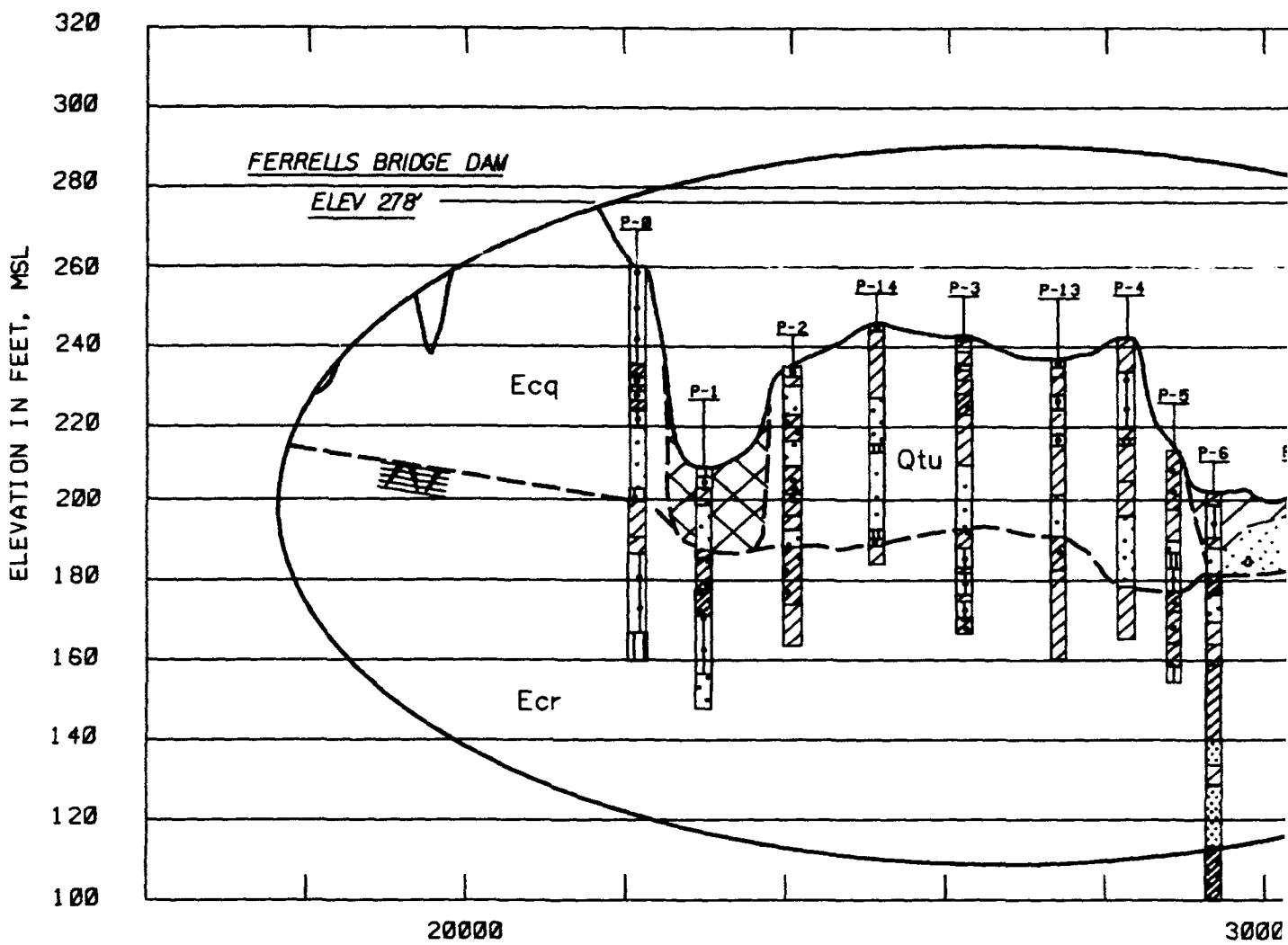
- [Box with 'Qai'] ALLUVIUM UNDIFF.
- [Box with 'Qtu'] TERRACE DEPOSITS UNDIFF.
- [Box with diagonal lines] TERTIARY SURFACE
- [Box with 'Eob'] SPARTA
- [Box with 'Eow'] WECHE
- [Box with 'Eq'] QUEEN CITY
- [Box with 'Eor'] REKLAW
- [Box with 'Ewu'] WILCOX UNDIFF.



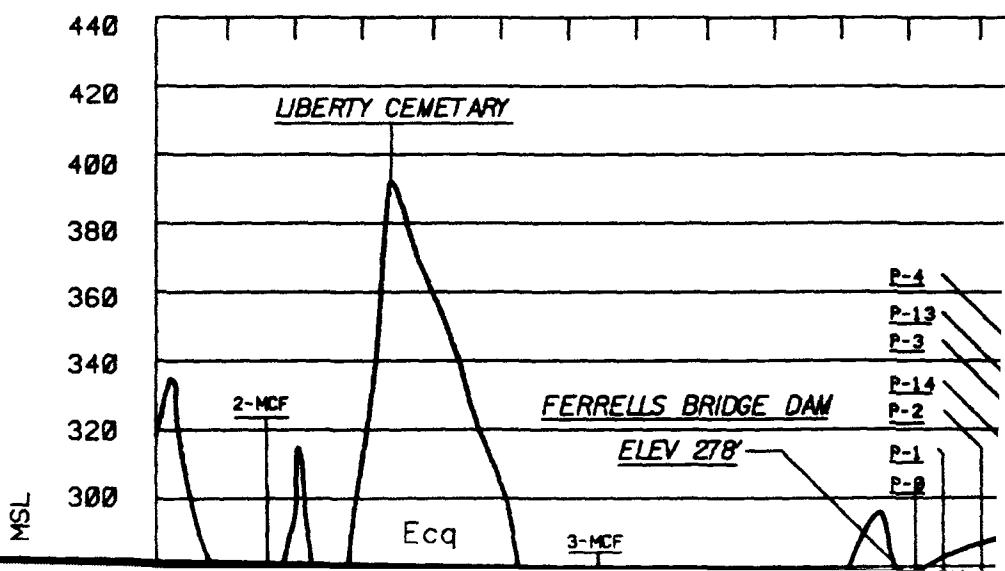
MAPPING SYMBOLS

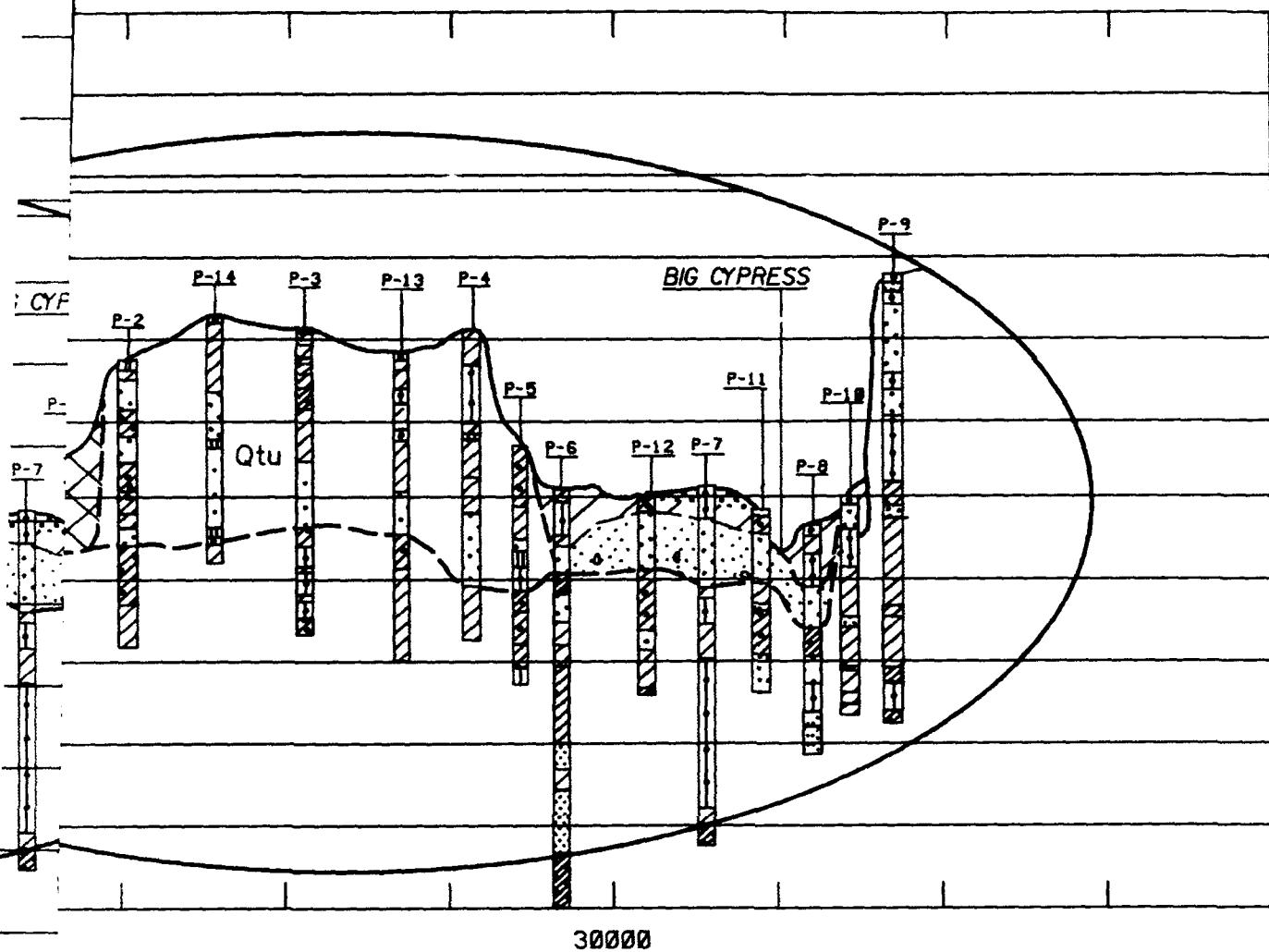
Qal	ALLUVIUM UNDIFF.
Qtu	TERRACE DEPOSITS UNDIFF.
	TERTIARY SURFACE
Eob	SPARTA
Eow	WECHES
Eod	QUEEN CITY
Eor	REKLAW
EWU	WILCOX UNDIFF.

GEOLOGICAL INVESTIGATION
SHREVEPORT, LA - DANGERFIELD, TX
SECTION A - A'
LAKE O' THE PINES
(ORE CITY)



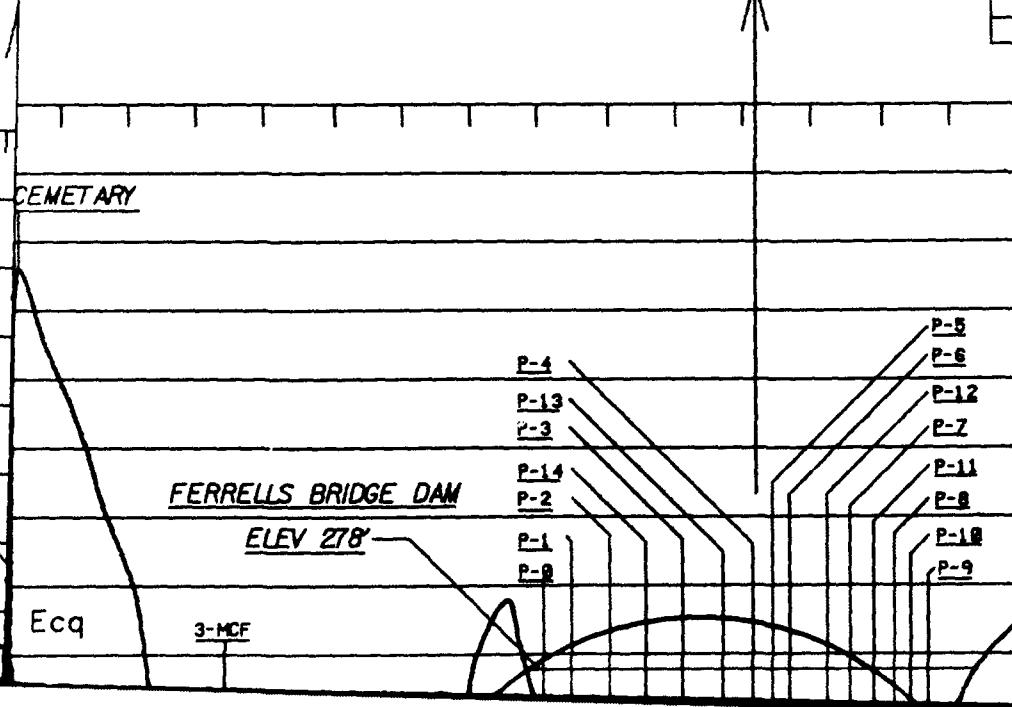
B

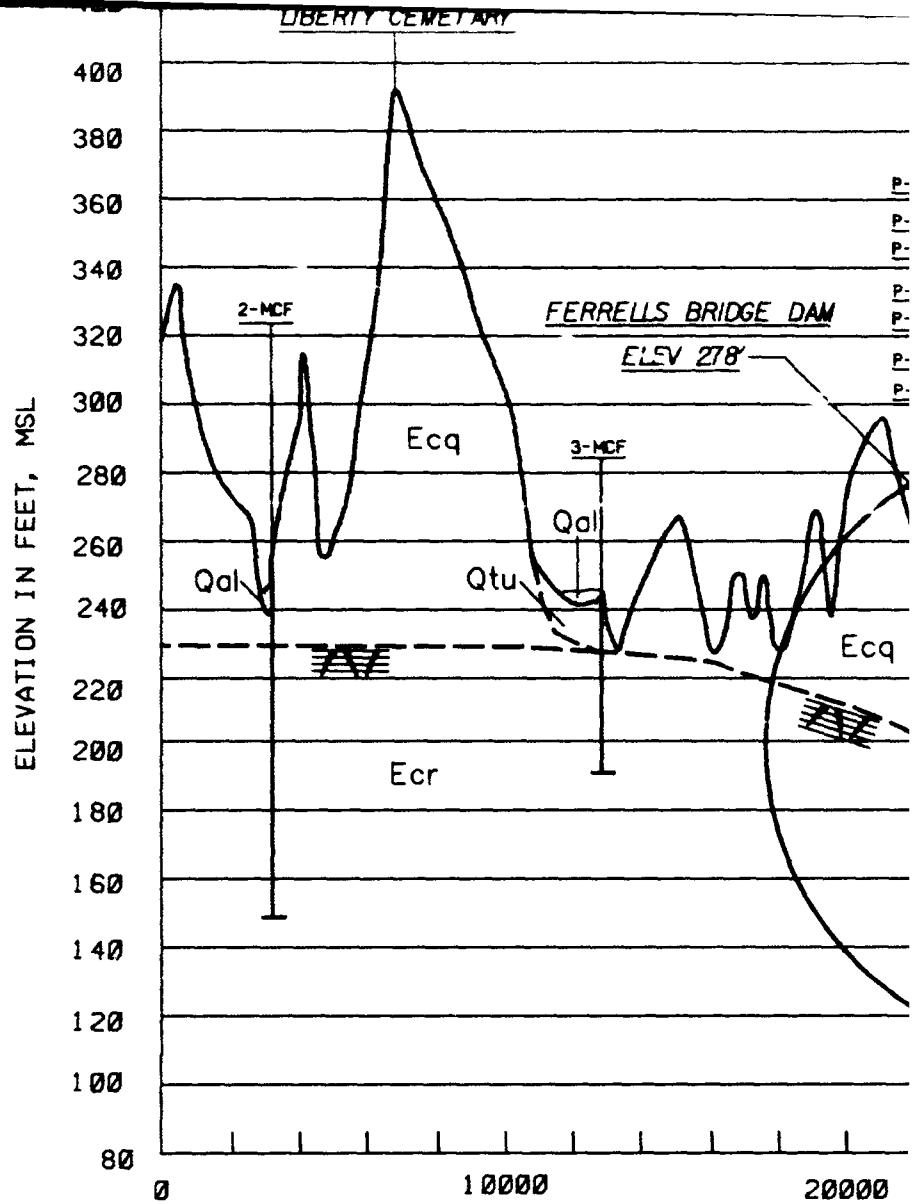




DISTANCE IN FEET

B'





LEGEND

ENVIRONMENTS OF DEPOSITION

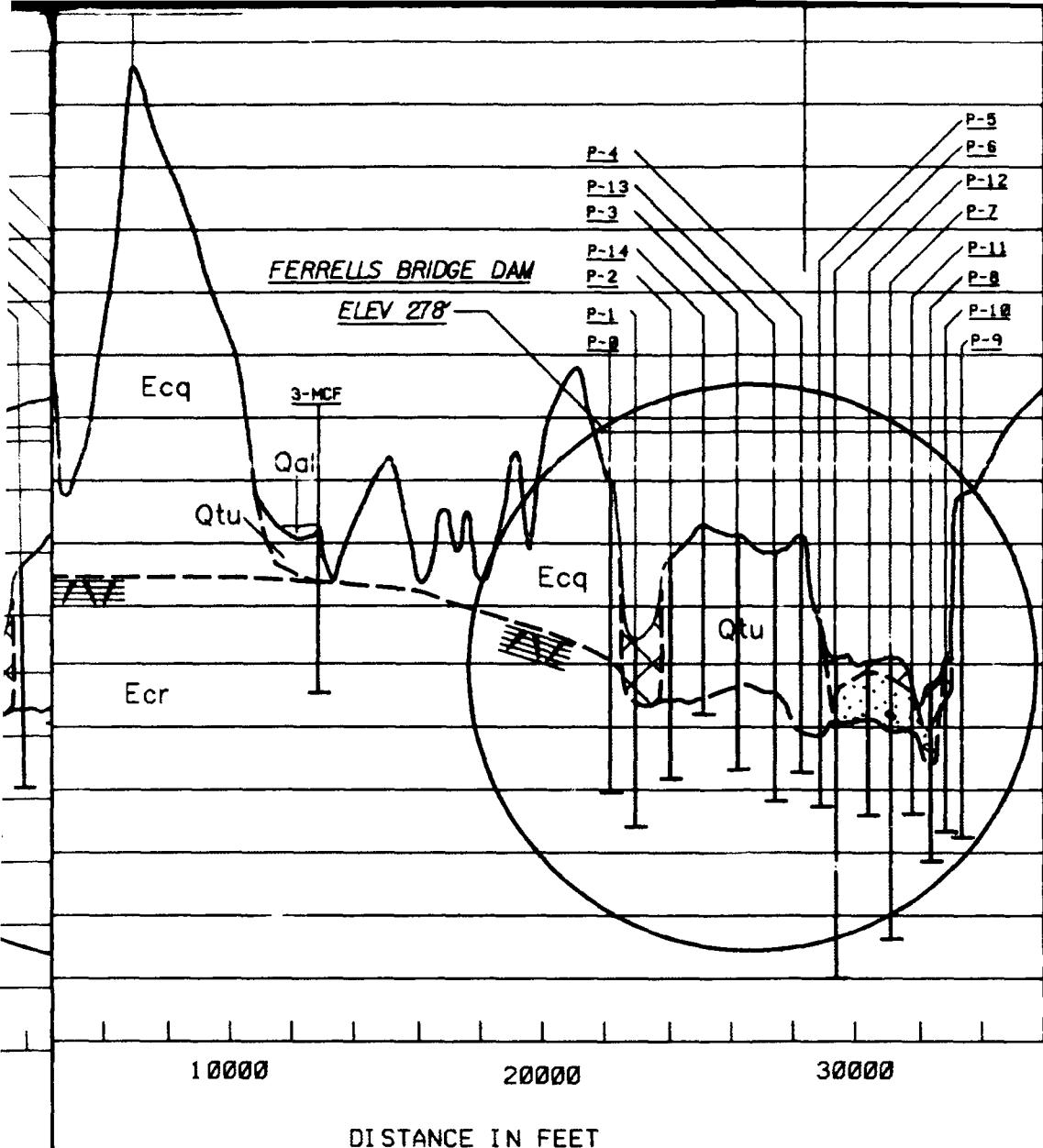
	NATURAL LEVEE
	POINT BAR
	BACKSWAMP
	ABANDONED CHANNEL
	ABANDONED COURSE

LITHOLOGY

	UNDIFFERENTIATED SAND AND GRAVEL
	SAND
	SILTY SAND
	SILT
	SANDY CLAY
	CLAY
	SHALE
	FILL

MAPPING SYMBOLS

	ALLUVIUM UNDIFF.
	TERRACE DEPOSITS UNDIFF.
	TERTIARY SURFACE
	SPARTA
	WECHES
	QUEEN CITY
	REKLAW
	WILCOX UNDIFF.



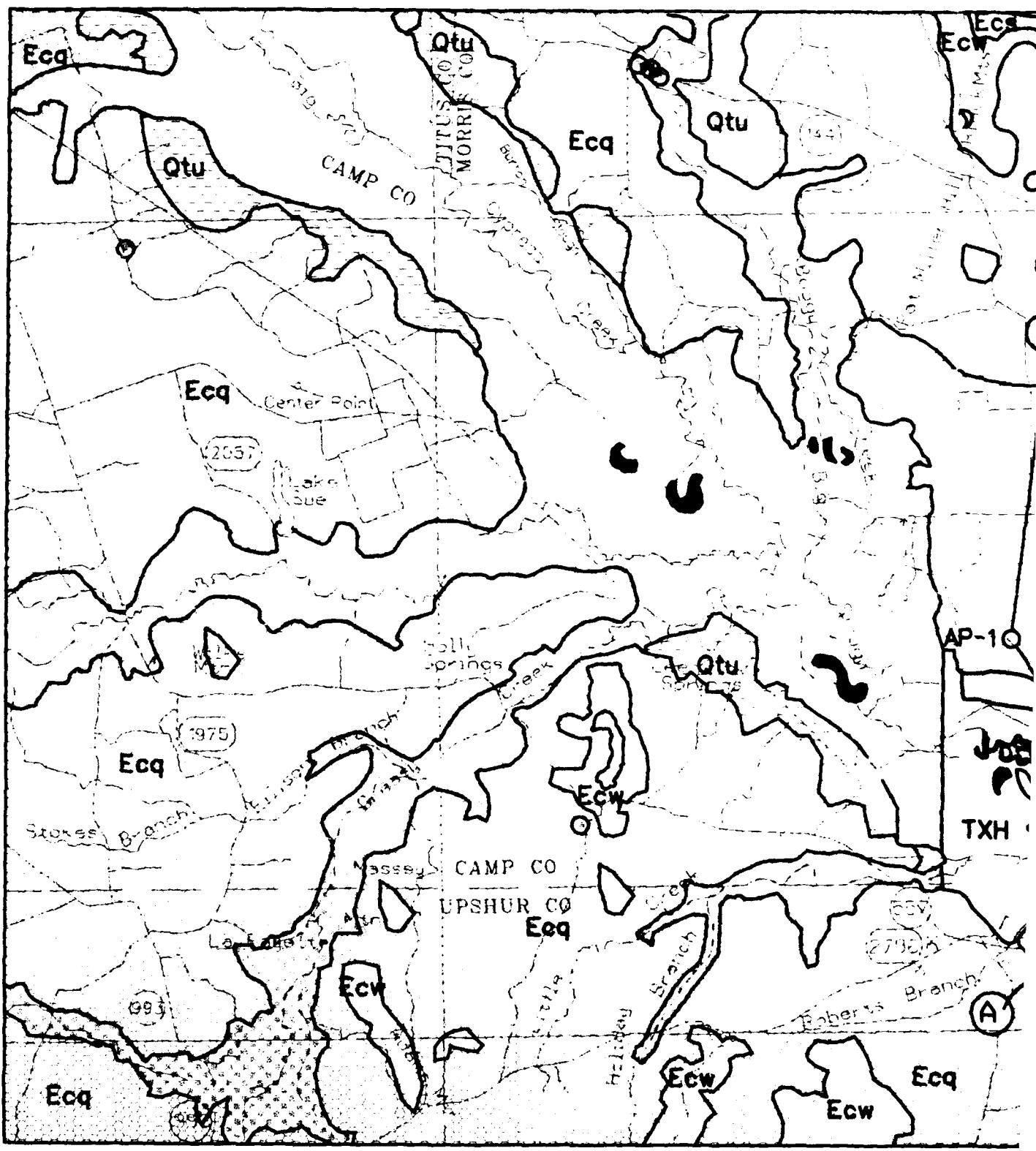
MAPPING SYMBOLS

Qal	ALLUVIUM UNDIFF.
Qtu	TERRACE DEPOSITS UNDIFF.
	TERTIARY SURFACE
Ecb	SPARTA
Ecw	WECHES
Ecq	QUEEN CITY
Ecr	REKLAU
Ewu	WILCOX UNDIFF.

GEOLOGICAL INVESTIGATION
SHREVEPORT, LA - DANGERFIELD, TX
SECTION B - B'
LAKE O' THE PINES
(FERRELLS BRIDGE DAM)

94° 52' 30"

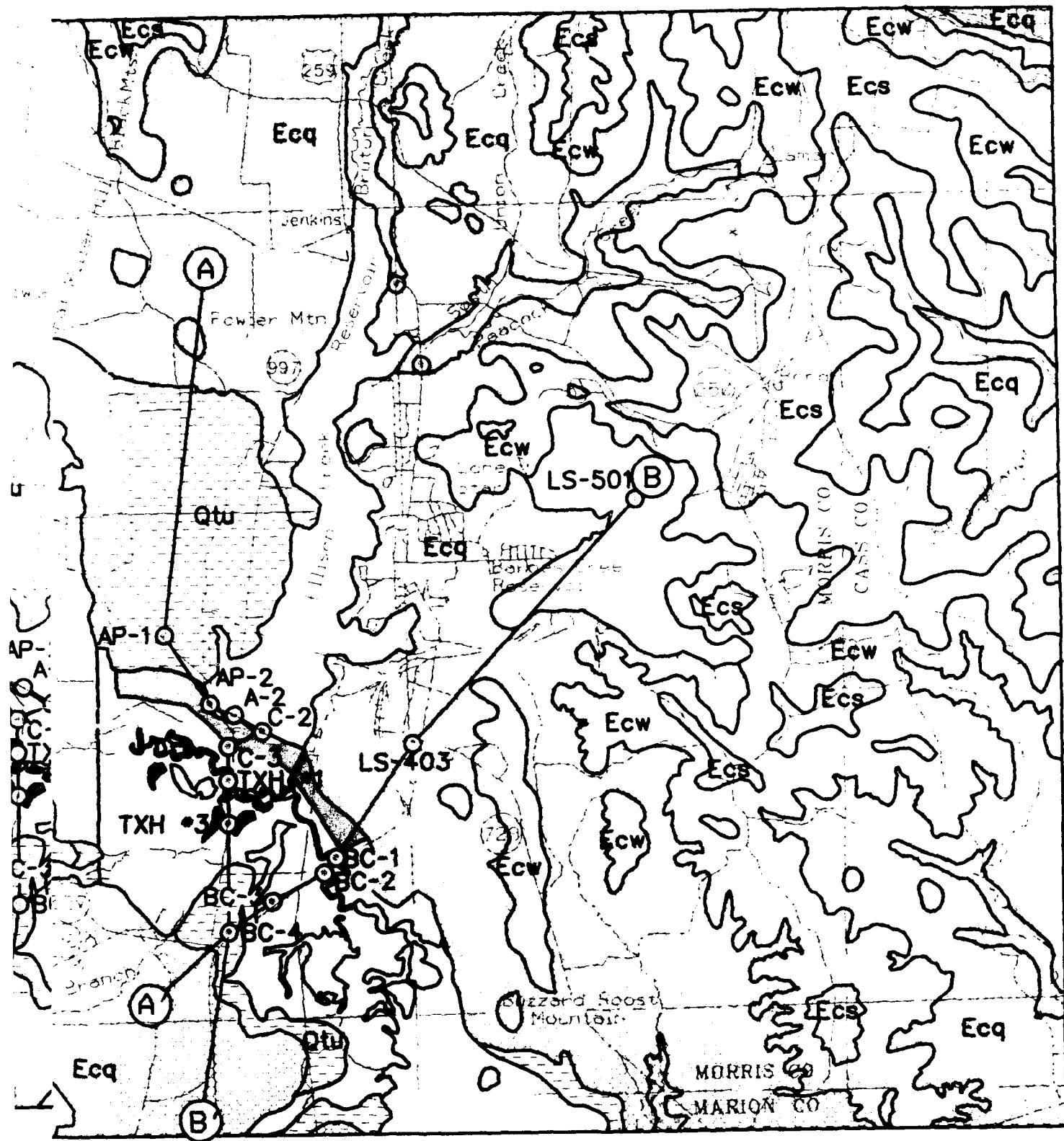
33° 00' 00"



32° 52' 30"

94° 52' 30"

44° 37' 30"
33° 00' 00"



32° 52' 30"
94° 37' 30"

LEGEND

QUARTERNARY

RECENT

-  NATURAL LEVEE
-  POINT BAR
-  BACKSWAMP
-  ABANDONED CHANNEL
-  ABANDONED COURSE
-  UNDIFFERENTIATED ALLUVIUM

PLEISTOCENE

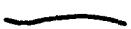
-  UNDIFFERENTIATED TERRACE DEPOSITS

TERTIARY

EOCENE

CLAIBORNE GROUP

-  SPARTA FORMATION
-  WECHES FORMATION
-  QUEEN CITY FORMATION
-  REKLAW FORMATION
-  WILCOX GROUP UNDIFFERENTIATED

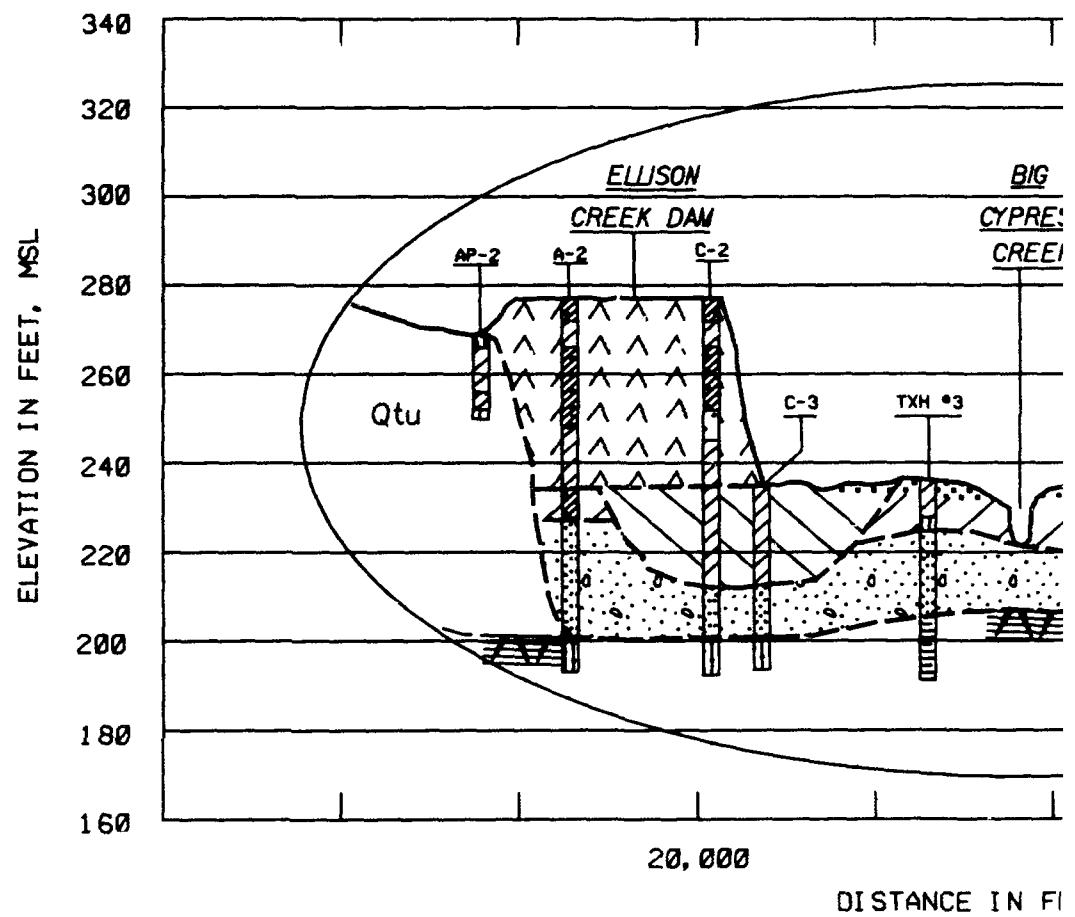
 CONTACT

 FAULT

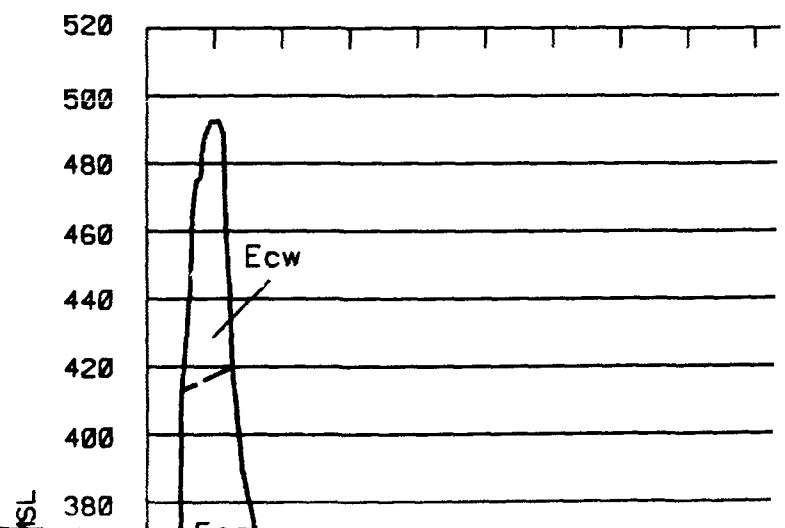
 BORING

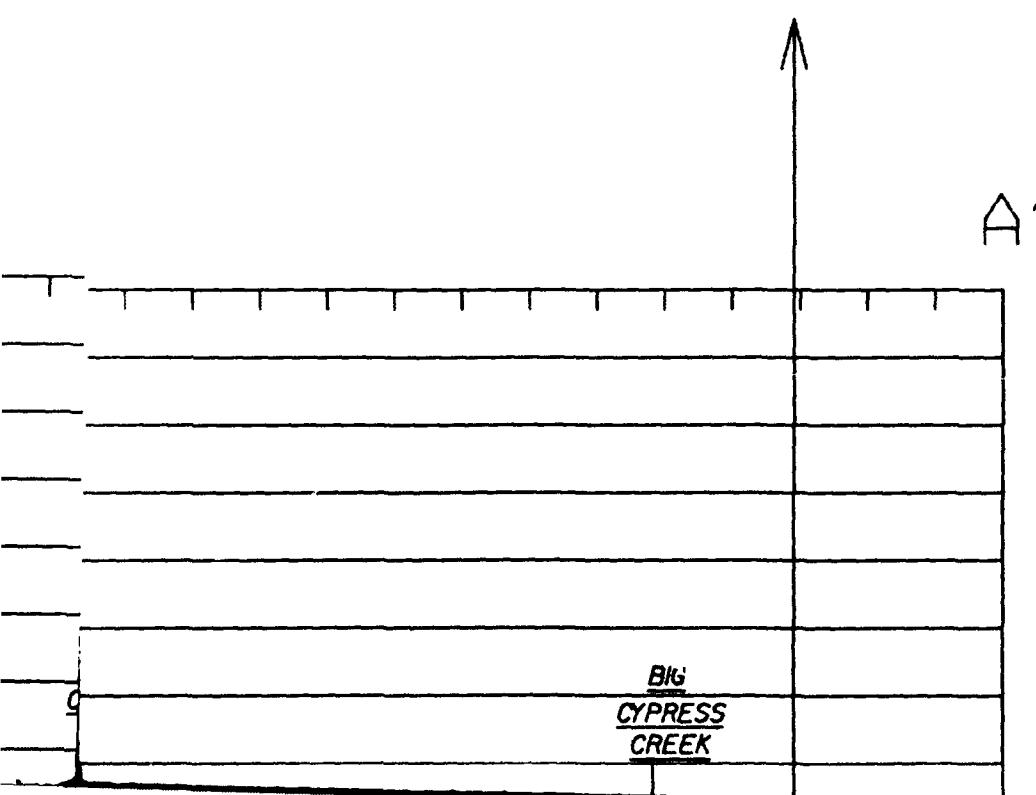
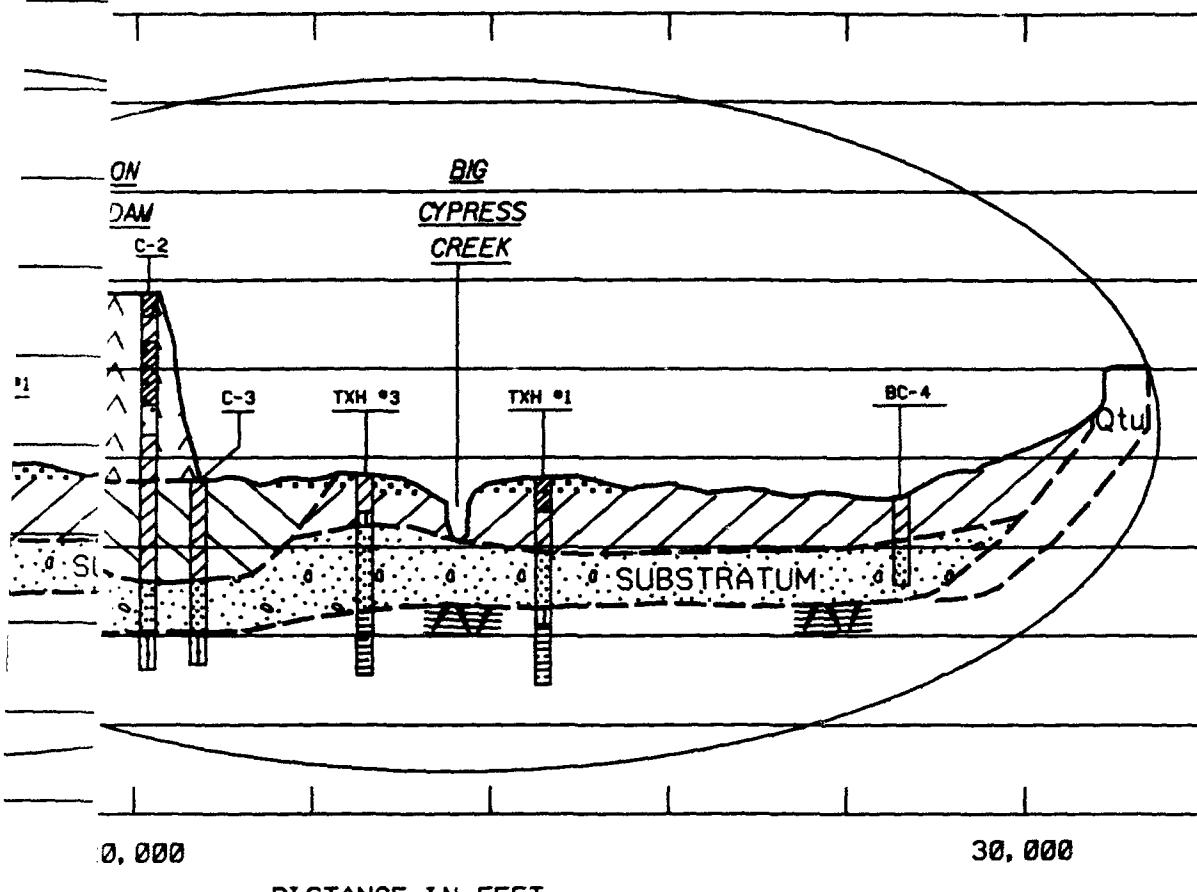
 PIEZOMETER

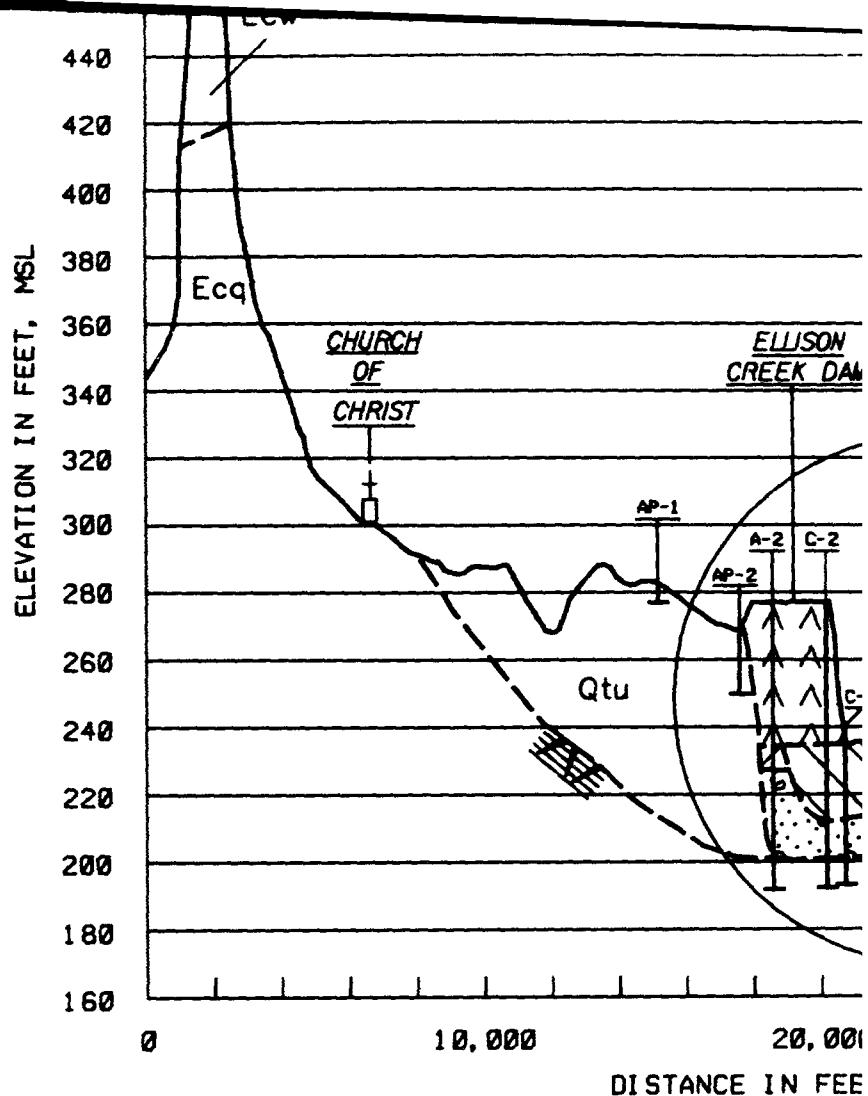
SHREVEPORT, LA - DANGERFIELD, TX
SURFACE GEOLOGY
LONESTAR, TX
2/92



A







LEGEND

ENVIRONMENTS OF DEPOSITION

	NATURAL LEVEE
	POINT BAR
	BACKSWAMP
	ABANDONED CHANNEL
	ABANDONED COURSE

LITHOLOGY

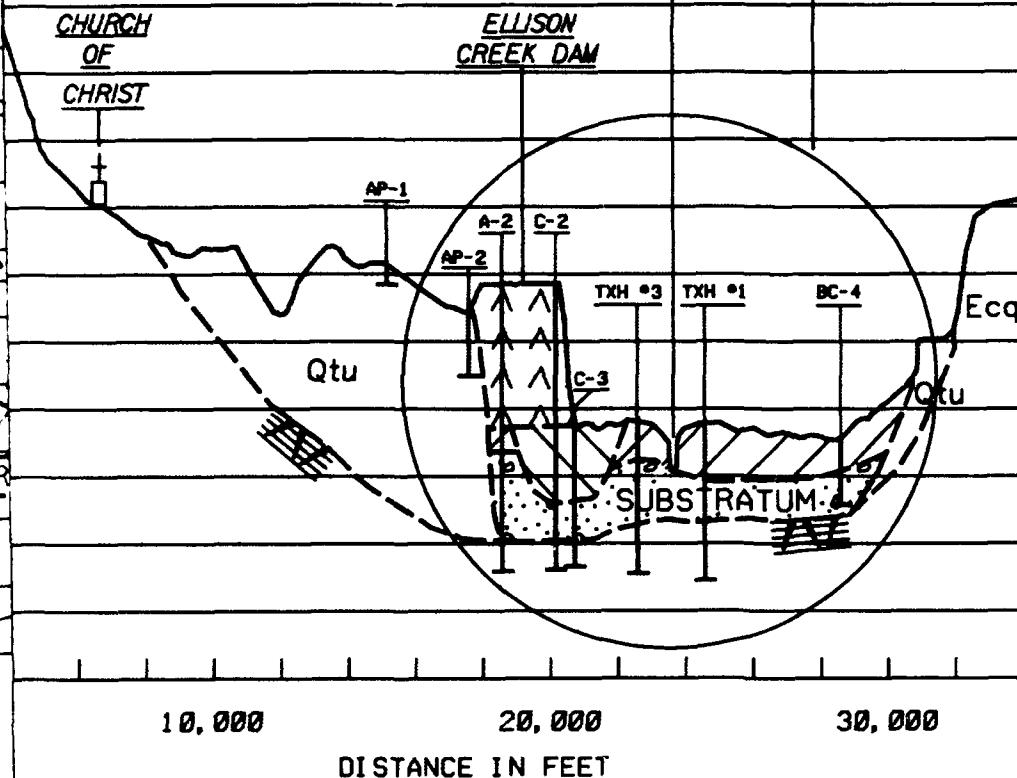
	UNDIFFERENTIATED SAND AND GRAVEL
	SAND
	SILTY SAND
	SILT
	SANDY CLAY
	CLAY
	SHALE
	FILL

MAPPING SYMBOLS

	ALLUVIUM UNDIFF.
	TERRACE DEPOSITS UNDIFF.
	TERTIARY SURFACE
	SPARTA
	MECHES
	QUEEN CITY
	REKLAW
	WILCOX UNDIFF.

BIG
PRESS
REEK

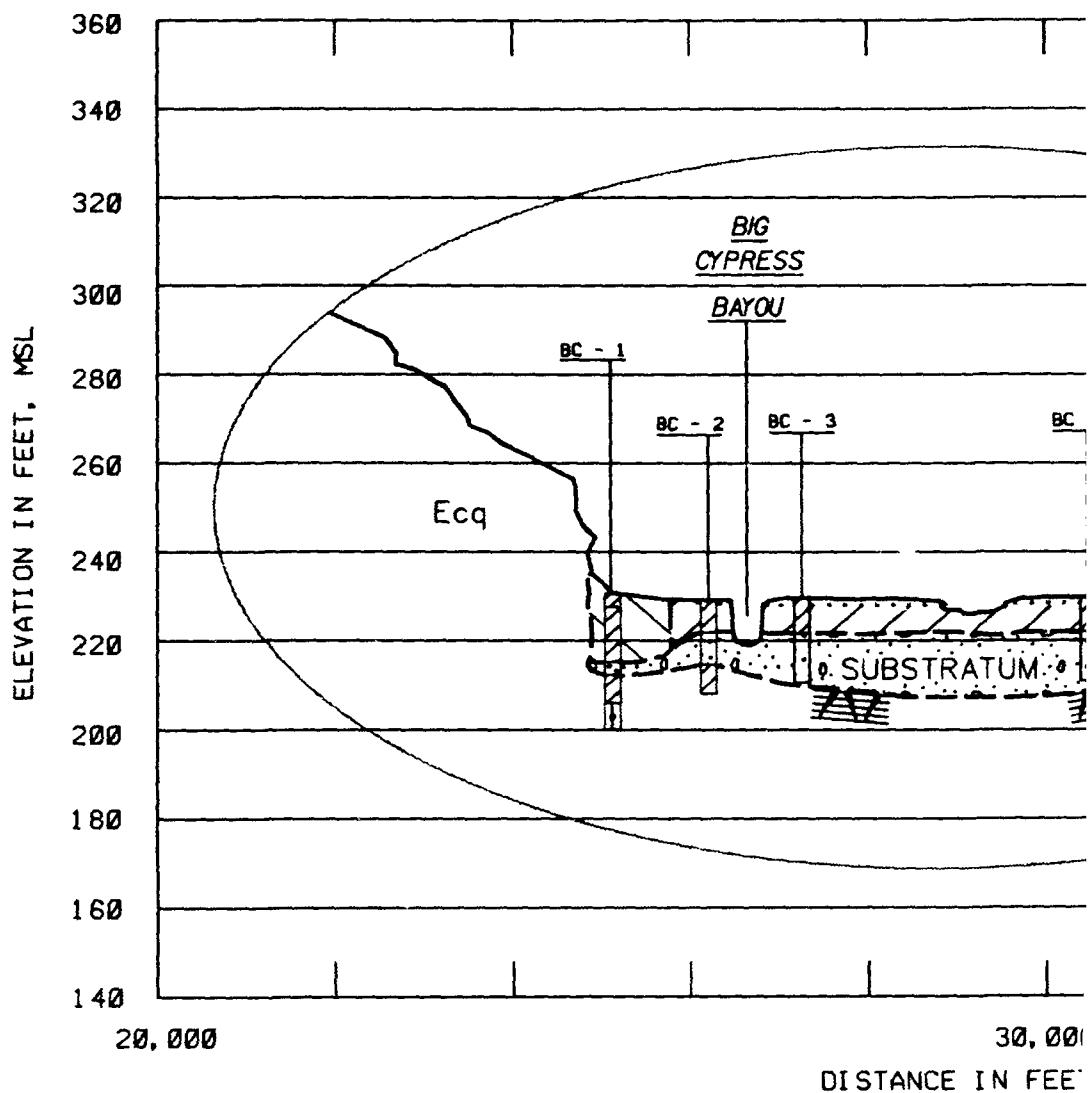
BIG
CYPRESS
CREEK



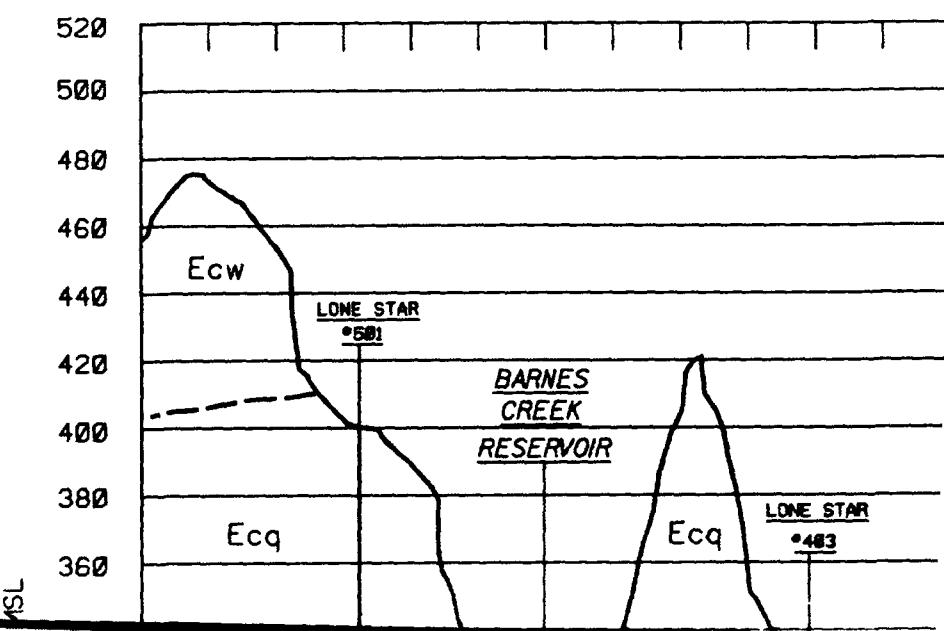
MAPPING SYMBOLS

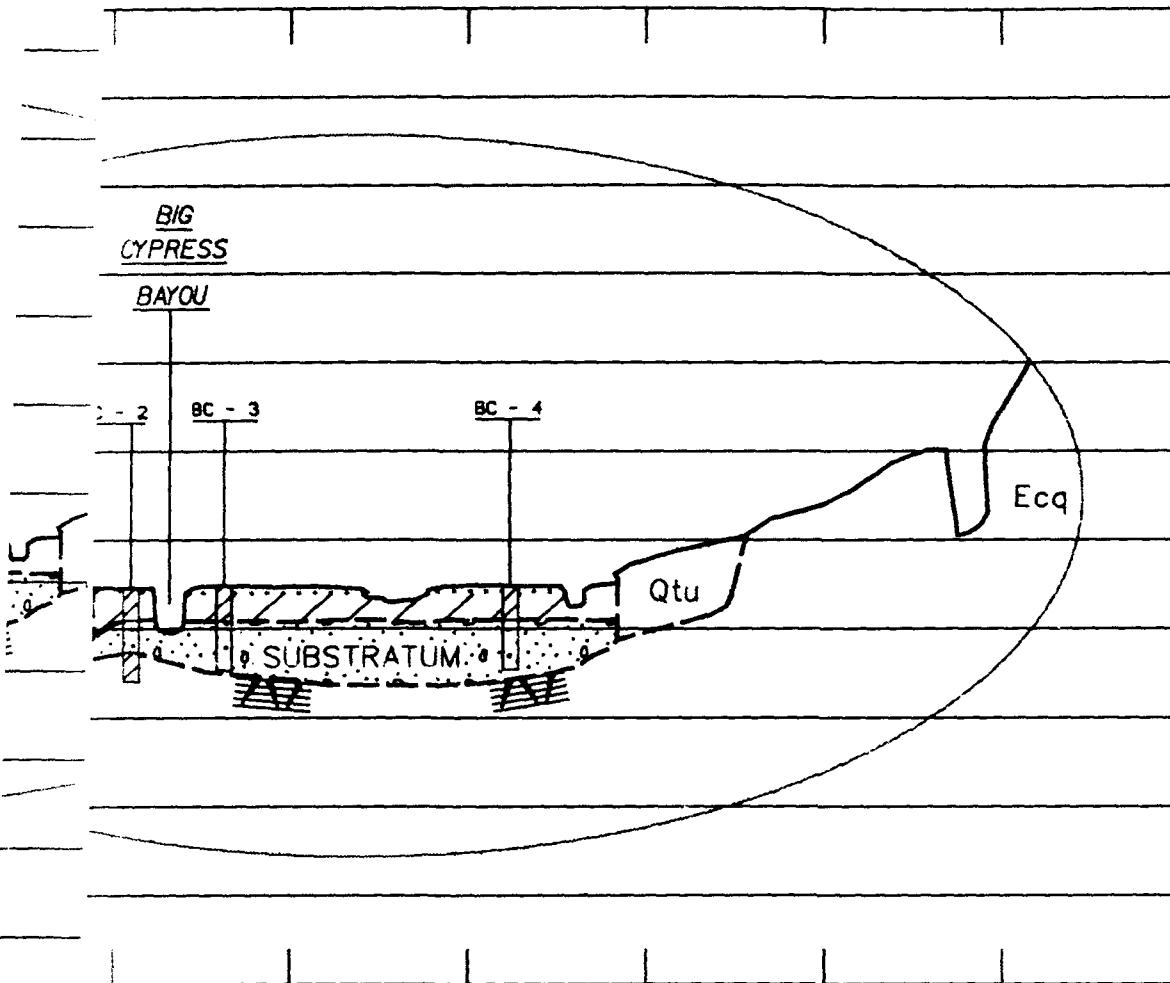
Qd1	ALLUVIUM UNDIFF.
Qtu	TERRACE DEPOSITS UNDIFF.
	TERTIARY SURFACE
Eos	SPARTA
Eow	WECHES
Eoq	QUEEN CITY
Eor	REKLAW
Ewu	WILCOX UNDIFF.

GEOLOGICAL INVESTIGATION
SHREVEPORT, LA - DANGERFIELD, T
SECTION A - A'
LONESTAR
(ELLISON)

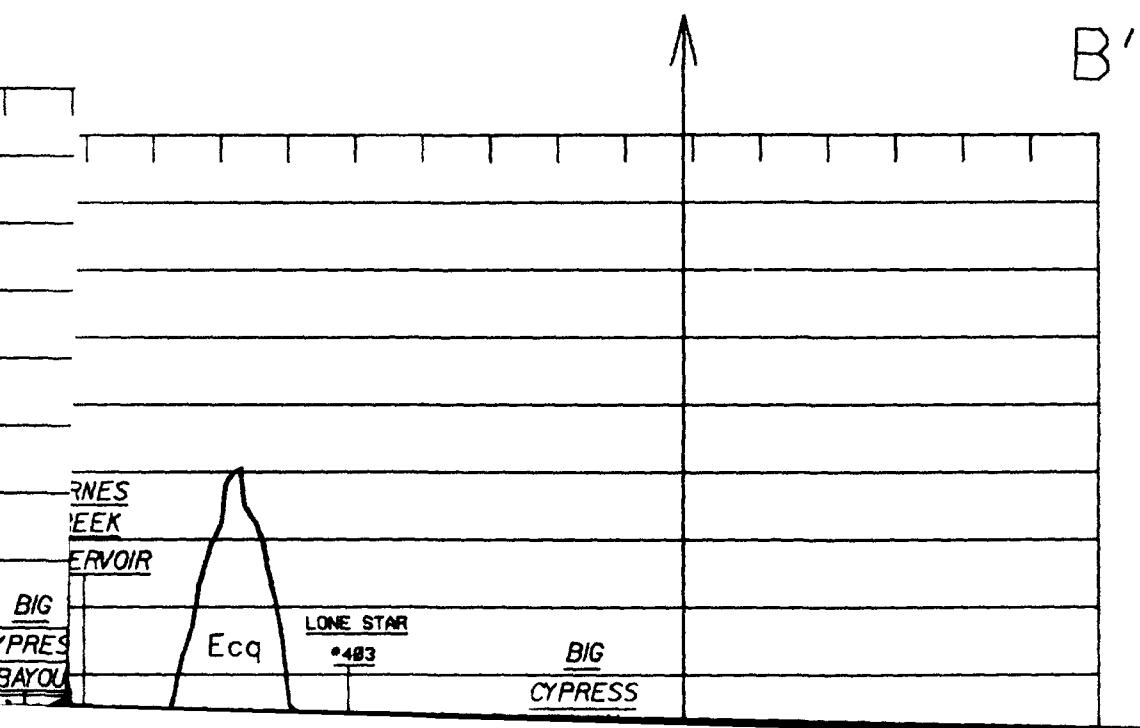


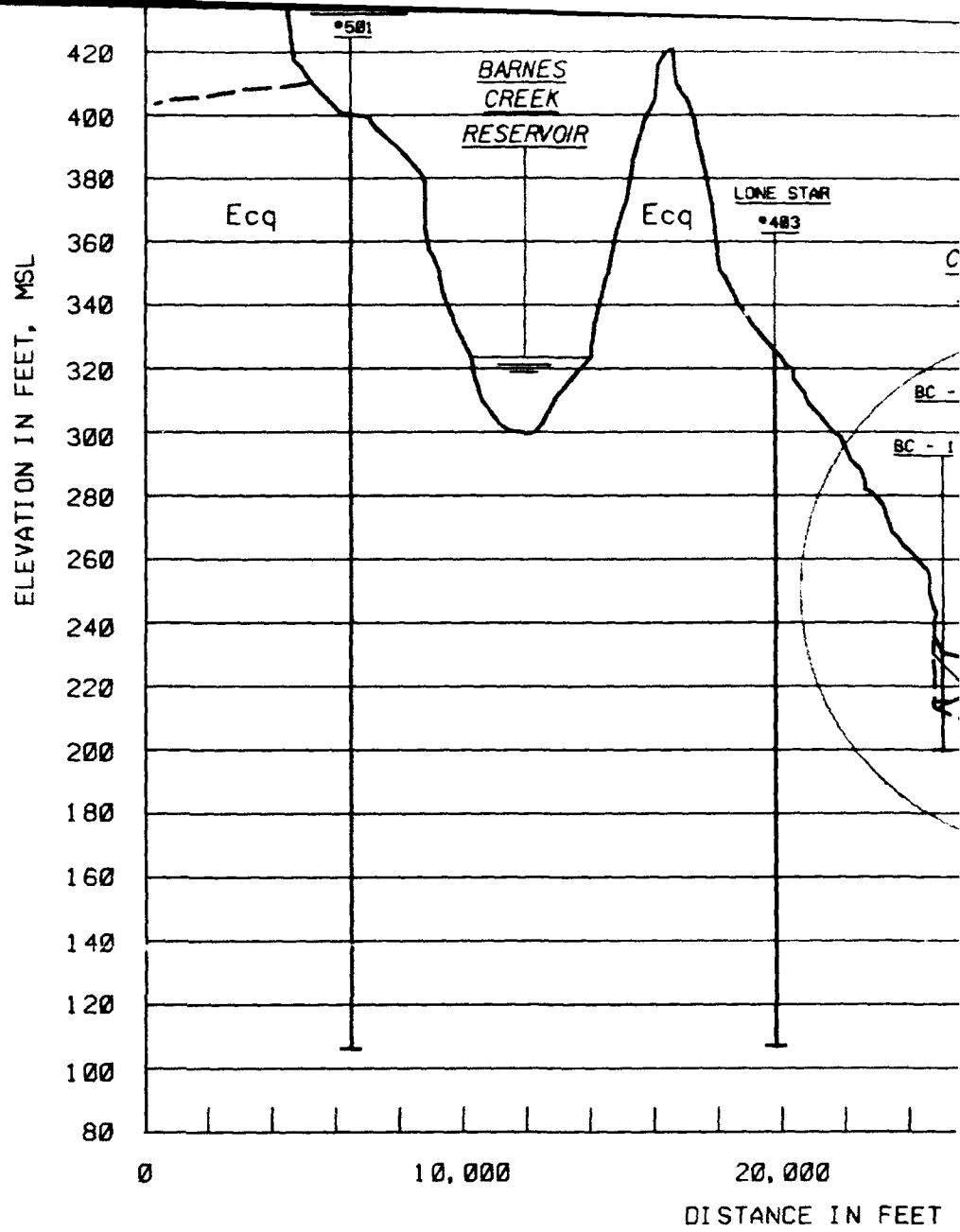
B





30,000
DISTANCE IN FEET





LEGEND

ENVIRONMENTS OF DEPOSITION

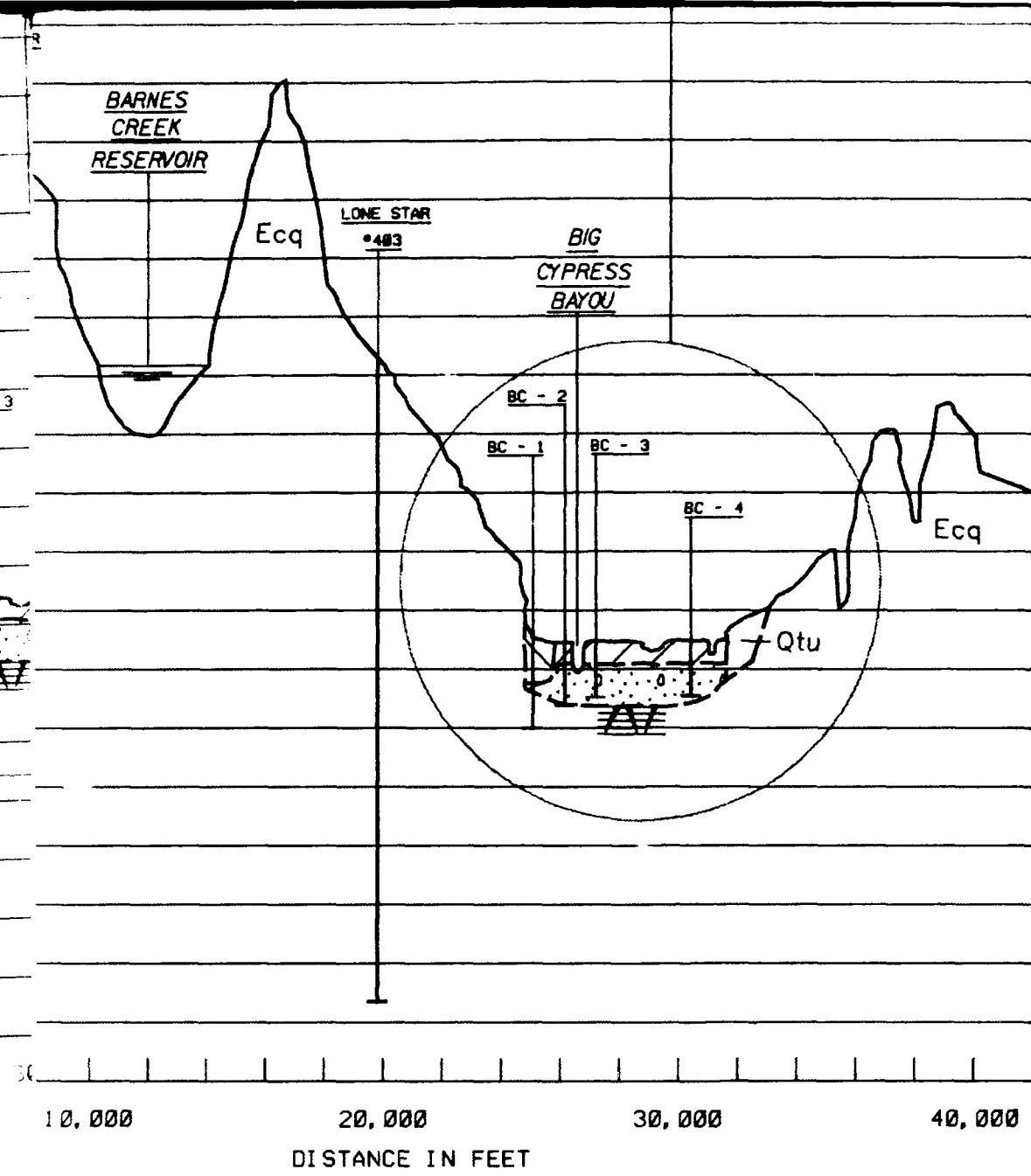
	NATURAL LEVEE
	POINT BAR
	BACKSWAMP
	ABANDONED CHANNEL
	ABANDONED COURSE

LITHOLOGY

	UNDIFFERENTIATED SAND AND GRAVEL
	SAND
	SILTY SAND
	SILT
	SANDY CLAY
	CLAY
	SHALE
	FILL

MAPPING SYMBOLS

	ALLUVIUM UNDIFF.
	TERRACE DEPOSITS UNDIFF.
	TERTIARY SURFACE
	SPARTA
	WECHES
	QUEEN CITY
	REKLAW
	WILCOX UNDIFF.



MAPPING SYMBOLS

Qa1	ALLUVIUM UNDIFF.
Qtu	TERRACE DEPOSITS UNDIFF.
	TERTIARY SURFACE
Ecs	SPARTA
Ecw	WECHES
Eqc	QUEEN CITY
Eor	REKLAW
EWU	WILCOX UNDIFF.

GEOLOGICAL INVESTIGATION
SHREVEPORT, LA - DANGERFIELD, TX
SECTION B - B'
LONESTAR
(HIGHWAY 259)